MARCH, 1939

ELECTRICAL SOUTH

BILOXI—on the Gulf Coast of Mississippi—is the most popular pleasure resort in the mid-south. American tourists visit here throughout the entire year.

Every comfort available is provided for the hotel guests in the Hotel Biloxi. The management helps nature's fine air conditioning system by installing HUNTER'S latest hotel type 36-inch ceiling fans in every bed room.

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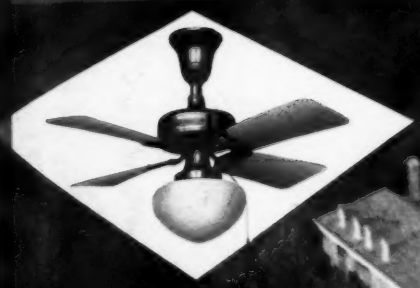
General Sales Offices: Memphis, Sterick Bldg. Eastern Sales Office: New York, 32 Warren Street



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STEEL.. STYLE.... COMFORT

Except for *steel*, the shoes we wear would be little better than medieval sandals, with their shapeless ugliness and destruction of foot health.

The arch which assures comfort, safety, lasting appearance, is made by a steel brace concealed in the leather. Heels are possible because of steel nails. Steel eyelets keep the laces from tearing the leather. The laces thread easily because of steel tips--to say nothing of the steel machinery vital to processing the leather and making the shoes themselves.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
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The Value Far Outweighs the Price

—and it opens a new field of quick turnover, full profits for dealers

The most efficient and thorough PAIR of vacuum-cleaning appliances ever devised, now costs the housewife *less than many SINGLE UNITS of limited usefulness.*

By combining the PREMIER VAC-KIT and PREMIER FLOOR CLEANER, dealers now have a sales-stimulating ensemble, unequalled in household appliance history. The amazingly big value for the unusually low price is certain to bowl over sales resistance, speed up turnover.

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FIRST—a time-tested, first quality floor model cleaner. SECOND—the amazing new Vac-Kit, a featherweight, cylinder-type cleaner, designed for every above-the-floor cleaning use. BOTH sell at a very low retail price.

That's the ensemble that is making history in the appliance field—and it comes in four most attractive price groups.

ONE of FOUR FAST-SELLING COMBINATIONS

Premier Floor Model PR30 with ball-bearing motor, Poro-Nap bag, double-action brush, searchlight. *Regularly...* $49.50

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TOTAL VALUE $79.00

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Prices slightly higher West of the Rockies

PREMIER
VAC·KIT AND FLOOR CLEANER *Combination*

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Company, Inc., 1734 Ivanhoe Road, Cleveland, Ohio. Send Complete information on Premier VAC-KIT, and four combination offers. Facts on attractive, low cost window display, available right now.

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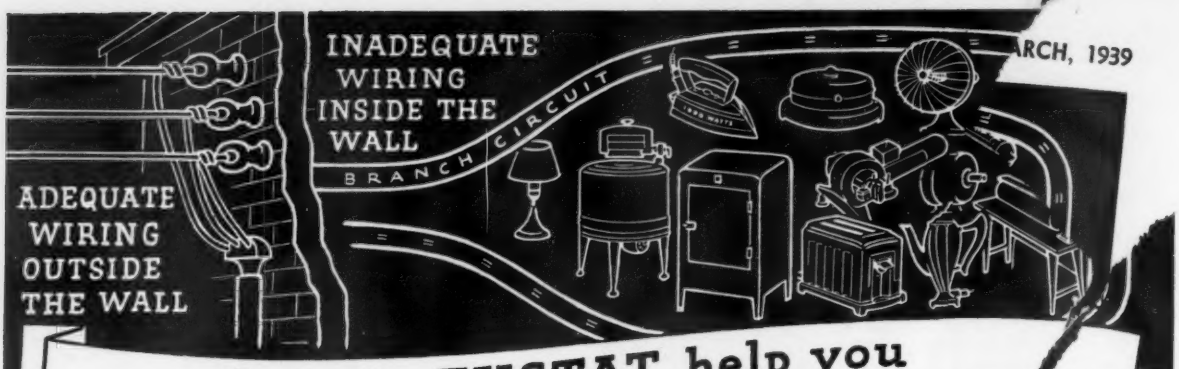

Let the FUSTAT help you BREAK the "BRANCH CIRCUIT BOTTLE NECK" ..that is hindering the full use of Electricity

The branch circuit is the "bottle-neck" of electric service, because through it flows all the "pay load" to the user. As this "bottle-neck" is overloaded, SATISFACTORY service diminishes because:

1. Overloading usually means a low-voltage condition that causes user dissatisfaction due to inefficient operation of lamps and appliances.

2. Overloading, when continued, often destroys the wiring and causes money loss to the user — revenue loss to the Utility and tremendous loss of good will to the entire industry.

The Fustat steps in to help correct this overloading evil

Its non-tamperable feature shuts out "handy men" from substituting too large a size, and tampering it in any way to permit overloading is virtually out of the question — without such tampering being clearly visible where it warns the user that all protection is gone.

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And by blocking excessive overloading it prevents overheating that destroys wiring, creates fire hazards and causes costly shutdowns.

User can't side-step adequate wiring issue

When additional circuits are needed the user cannot readily side-step the issue at the sacrifice of safety. New circuits that increase efficiency of appliances and encourage their greater use must be installed.

Permits more outlets per circuit

Adding a maximum number of outlets is a perfectly safe practice because the Fustat guards the circuit against overloading.

Wipes out any excuse for tampering

A Fustat won't blow when washing machines, refrigerators or other motors start because of its long time-lag. It wipes out any excuse for tampering or the use of fuses too large to properly protect when shorts occur in flexible cords.

Guards against blowing of main fuses

The branch circuit Fustat will almost invariably open on a short-circuit or overload, AHEAD of the main fuse or Fustat — because it cannot be replaced by an oversize fuse or readily tampered. When it does open to protect, only the *normal load of one* circuit is off the line instead of a user possibly having all of his lights and appliances out of service because the main fuse blew.

Helps get more appliances on the line

The circuit can be loaded to approved capacity without needless blows—or sacrifice of safety—for the Fustat doesn't blow on starting currents.

What is the Fustat?

It is a fuse to which a thermal cutout is added.

It protects like a fuse against short circuits—even high resistance shorts such as occur in flexible cords.

It protects against permanent overloads, even when as light as 25%.

Yet it will not blow on motor starting currents of washing machines or other appliances.

It has a base that guards against anyone robbing the circuit of protection.

It fits Edison base fuse holders through the use of an inexpensive adapter.

Adapter retails at 7½c

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The FUSTAT

THEY GO TOGETHER

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JEFFERSON ELECTRIC COMPANY, Bellwood, Ill.
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NATIONAL ELECTRIC PRODUCTS CORP., Fulton Bldg., Pittsburgh, Pa.
UNION INSULATING CO., 27 Park Place, New York City

Retails at 7½c in 15 to 30 amp. sizes

MARCH, 1939

Volume 19 No. 3

ELECTRICAL SOUTH

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JOHN C. COOK, Sales Promotion Mgr.
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THE GREAT STEAMBOAT RACE of 1870

...when we were one year old.

The *Robert E. Lee* steamed up the Mississippi . . . reached St. Louis first from New Orleans . . . in one of the most famous steamboat races of the nineteenth century.

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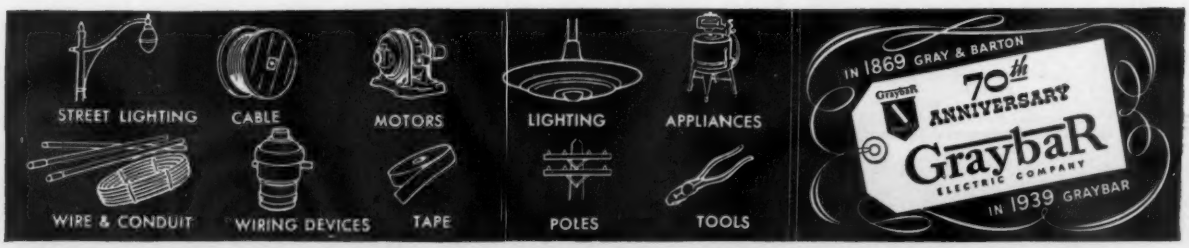
It brings you these products quickly and conveniently through your nearby Graybar warehouse. And it backs every product with Graybar's reputation for reliable equipment . . . a reputation for dependability that goes back 70 years to 1869.



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Electrical South Presents

A Progress Report on the Adequate Wiring Program

Carl W. Evans, Editor

THE National Adequate Wiring Program, sponsored by all branches of the electrical industry celebrates its first birthday in March, 1939.

Electrical South marks this occasion by devoting a considerable part of this issue to a review of the progress of the adequate wiring program in the South and to discussions as to how the program best may be made to serve the industry in the future.

When the National Adequate Wiring Program was announced nearly a year ago it was not expected that the industry's needs would be fulfilled overnight. However, because the Program fills a definite need, basic to the industry's development, its growth has been even more rapid than was expected.

Adequate home wiring is being promoted in more than thirty of the principal trading areas of the South as well as in many smaller communities. But these local promotions are not all cut from the same pattern. Some have been developed rapidly and are already paying their promoters dividends in the form of increased business. Others are just beginning to get into stride.

As might have been expected, greatest progress has been observed in those communities where the industry has learned to cooperate. The broader aim of the Program, the education of the public to the convenience and economy of adequate wiring, represents an objective too broad to be accomplished by any single group.

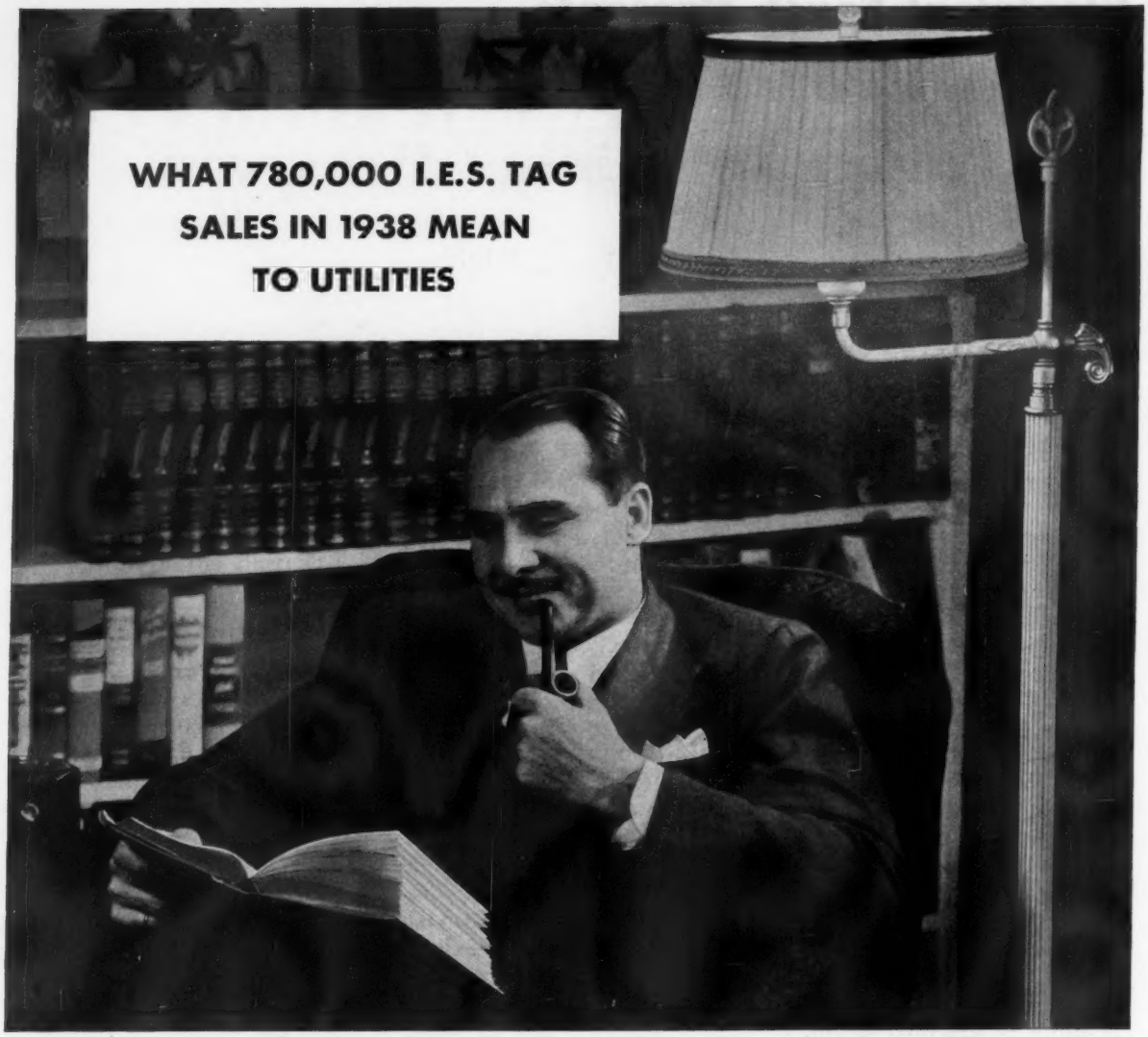
A survey of the local promotions in the South indicates that the cooperation of the electric utility is essential to the success of any plan. In most cities, the utility has been an important factor in developing the local program and results have been most favorable where the utility has utilized its resources to carry the message of adequate wiring to its customers. In no instance has any local program enjoyed more than mediocre results where the whole-hearted support of the utility was not forthcoming.

In reviewing the many local promotions conducted in the principal trading centers of the South, it is difficult, at this stage of the Program, to uncover much in the way of tangible results. Only a few cities have adopted the Certification Plan although many others are contemplating it. Those cities which have adopted the Certification Plan are only just beginning a substantial promotion of it through sales effort directed toward architects, speculative builders, and individual prospective home-builders.

Although tangible results may be lacking, there is ample evidence that substantial progress has been made in furthering the aims of the Program.

In particular, the National Adequate Wiring Program has had considerable influence on the revision and enforcement of local ordinances relating to electrical wiring. In several large cities of the South electrical ordinances were revised during the past year and in some of these the minimum requirements for adequacy as adopted for the National Program were included in these ordinances as minimum wiring requirements.

One of the difficulties encountered has been the tendency in some cities for the larger and more substantial electrical contractors to specialize in industrial and commercial work. Many contractors of this classification decided at the start that the Program, being directed as it was toward the residential customers, could not be of any great service to them and as a result have not given it their support. These contractors may be interested in the progress that has been made by others in extending the principles of the National Campaign into the industrial and commercial fields.



APPROXIMATELY 780,000 I.E.S. Certification tags were sold last year. In the last quarter alone, the sales of these tags in 1938 showed an increase over 1937 of more than 74 per cent.

Of course, these tags in themselves are an indication of added load for lighting companies. But that's only a start. The first part of this year will witness the most powerful spring advertising campaign ever launched in I.E.S. history.

Millions of people—thousands of them your customers—will see General Electric advertising featuring I.E.S. Better Sight Lamps in these magazines: *Saturday Evening Post, Colliers, Liberty, Ladies' Home Journal, Women's Home Companion, McCalls, American Magazine, Cosmopolitan, Redbook, Good Housekeeping, Parents', and Child Life.*

Lighting directors and home lighting supervisors now have more effective reasons than ever to urge department stores and other portable lamp outlets to stock the new I.E.S. Better Sight Lamps . . . in table, floor, and wall models.

Each I.E.S. Better Sight Lamp installed is an added load builder for the utility. For further information, write to General Electric Company Dept. 166-ES-C, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC
MAZDA LAMPS

General Electric does not make I.E.S. Better Sight Lamps but publishes this in the interest of better sight.

FOR THREE-LIGHT LAMPS -
MAZDA THREE-LITE BULBS
100 - 200 - 300 WATT
now only . . . 60c
50 - 100 - 150 WATT
now only . . . 45c
THEY STAY BRIGHTER LONGER

Constructive Wiring Programs Conducted in South

By W. E. Sprackling
Chairman, National Adequate Wiring Bureau

WITHIN the short space of twelve months the electrical industry representing many cities in the South has organized to promote adequate wiring with an aggressiveness and ingenuity that has already brought heartening results.

The National Bureau welcomes this opportunity to say something about the excellent wiring promotions that are underway from the shores of Delaware to the westernmost reaches of Texas.

One of the high-spot operations is that being conducted in Birmingham, where the Home Service Advisors of the Birmingham Electric Company are showing householders how easily they can rearrange electrical outlets for more convenient use, the practical methods for recircuiting to obtain more adequate power supply and how they can place wall switches to assure "safety with light."

Girls Contact Homemakers

The utility's staff of twenty girls regularly contacts approximately 3,000 to 3,500 homemakers each month. Using paper outlet cutouts (now available through the National Bureau), they have developed a practical approach to the rewiring market that is producing additional wiring business. The cutouts serve to dramatize the added convenience of more outlets, properly placed and facilitate the work of estimating the job. Names of prospects are turned over to cooperating contractors by the company.

It is this sort of carefully planned and executed approach to the rewiring problem that has proved successful since it is based on what really amounts to missionary work on behalf of a much needed public service.

Back of many of the comprehensive wiring programs now underway or being organized is a sound basis of industry education. The Adequate Wiring and Lighting course conducted in Miami last year by the Florida Power and Light Company is a splendid case in point. Eight weekly meetings were held, with an average attendance of 150 contractors, wholesalers, architects and builders.

And now, as the next step, the utility is cooperating with the Florida Electrical Contractors and Dealers Association in organizing an adequate wiring promotion plan that will be conducted in the territory served by the former. A series of meetings on the subject of the National Adequate Wiring Program began this February.

Extensive Building in South

Throughout the South the industry is turning its attention to the new home field. The thousands of new residences being planned for this year constitute a challenge that bears a direct relationship to the industry's No. 1 problem. These homes must be more adequately wired than new homes have been in the past. There is every indication that they will be for literally hundreds of men and women in Southern cities are contacting prospects and working with architects and operative builders.

Every phase in the entire promotional setup of the National Adequate Wiring Program is being employed in one or another of these operations — the sound slide film, "Power for Living," newspaper advertising mats, publicity releases, direct mail, lecture chart, window displays, billboards, cartoon booklet and so on right down to the small stickers.

The very foundation of the new home market, is educational work of the untiring day-by-day variety with the certification feature operating to advantage in Charlotte, Birmingham, Chattanooga, Dallas and Richmond. In addition, many ingenius methods are being utilized. Adequate wiring displays that carry a real punch, radio broadcasts that have drawn better than average listener response, prize contests, unique model home exhibits such as that planned for Roanoke's electrical show in which the home's wiring will be shown back of glass strips . . . all these and many more are being used effectively.

The issuance of the first adequate wiring certificate to the home owner has been made an occasion for publicity by several local wiring bureaus since it affords a good opportunity to focus public attention on a constructive industry effort. Supporting and unsolicitated statements have been received from architects, builders and the recipients of these certificates expressing their interest in and appreciation of the importance of adequate home wiring. In some instances cooperative work with building groups and individual operative builders and architects has resulted in unqualified acceptance of the adequate wiring standard.

New Homes Set Style

The new and adequately wired homes in any community—whether the wiring is certified by a League or Adequate Wiring group or not—set the pace *and the style* for other dwellings. They are electrically modern and not, as too often happens, electrically obsolete be-

(*Continued on page* 32)

Viewpoint of Industry's Leaders On the Wiring Program

Utility . .

By Bryan C. Hanks
President, Florida Power and Light Company

ADDITIONS to utility load are already being seriously burdened by inadequate wiring, and our own salespeople are, with ever-increasing frequency, encountering the wiring obstacle. Electrical dealers state that the failure to sell additional loads can be directly attributed, in many instances, to the lack of, or the high cost of providing, adequate wiring. Greater use of increased lighting and the many appliances which the public are purchasing annually is being seriously impeded because of insufficient copper in existing buildings.

Because all of these conditions are facing the industry, the Florida Power & Light Company is vitally interested in securing the cooperation of all other branches of the industry to help solve this problem for the benefit of the public which it serves.

Mr. Hanks

Utilities believe that the best interests of the consuming public, and ultimately of every major electrical group, will be best served by a satisfactory settlement of the minor differences of opinion among ourselves, and earnestly urge that a very definite and whole-hearted effort be made to reconcile the differences that now exist among us.

A careful study of types of wiring systems best suited for their intended applications which will permit economical installation costs is well under way. Unfortunately, wiring is not too appealing to the general public, but is of vital importance to the utilization of the equipment.

With the large amount of interest existing among the various phases of the industry, it begins to appear that if we take advantage of the more recent scientific developments the public will be able to receive maximum benefits of a highly desirable and safe wiring installation. Progress towards better wiring can be expedited by more effective cooperation with local inspectors and jointly considering trial installations of new developments which have been designed to meet the increased need of more copper and greater accessibility to it.

The Florida Power & Light Company wishes to do its share in helping to solve the inadequate wiring situation.

Wholesaler . .

By R. A. Clark
Southeastern District Mgr.
General Electric Supply Corp.,

FROM the distributor's point of view, the National Adequate Wiring program provides the most effective means yet found for combating the "tight wire" evil and for promoting good electrical wiring.

Of necessity, the distributor's place in the electrical industry of any community is in the background. Distributors perform their function when they superintend the smooth flow of materials from the manufacturer to contractors and dealers. Their contact with the eventual user is only indirect.

Much as distributors recognize the need for better wiring there is nothing they can do about it except provide helpful suggestions and ideas for contractors and dealers to use or join with other members of the electrical industry in local and national activities.

Mr. Clark

Here in the South there have been group campaigns of one kind or another ever since the need for better wiring was first recognized —back in the days when adequate wiring meant a few more outlets.

Some of these activities were more successful than others, but in all of them distributors have taken part. Here was an effective means of broadening the market for electrical merchandise. Everyone who took part benefited naturally—the manufacturer, the contractor and dealer and the distributor.

The advent of the National Adequate Wiring Program a year ago is proving to be more beneficial than any previous activity. It was introduced at a time when something definitely needed to be done. Many new electrical appliances for homes have been put on the market during the last few years. It was inadequate to wire new homes now as they had been wired before the days of numerous appliances and improved lighting. Electrical adequacy had come to mean enough copper, proper cir-

cuit design and ample switches, as well as enough convenience outlets.

But a spark was needed and a plan for informing the public. The National Adequate Wiring Program furnished both. Through it adequate home wiring is already being promoted in 30 of the principal trading areas in the South and in many smaller communities. And the movement is just getting under way.

The widespread interest in the program, its industry-wide support and national cooperation assure continued effectiveness. Distributors naturally want to cooperate in every way they can. It does for them what they cannot do for themselves—acquaints their customers' customers of the necessity of adequate wiring. Incidentally more wiring materials will be required and a broader market developed for appliances.

Inspector . .

By A. J. Bommer
President, Southern Section
I.A.E.I., Dallas, Tex.

A MEANS of securing an adequately wired electrical job has long been the dream of nearly all electrical inspectors. Many times when inspectors have attempted to secure adequate electrical wiring they have been criticized as "trying to load the cost" or "make more work." Such was not the case, the real facts being that the inspectors had learned from past experience that inadequate electrical wiring would and did result in overload conditions which sooner or later developed into potential fire hazards and at the same time, aside from being unsatisfactory, were quite uneconomical.

Adequate wiring, from the inspectors point of view, is the answer to satisfactory, safe, economical and lasting use of electricity as a servant without constant changing of wiring.

With the advent of the sponsored program for adequate electrical wiring the inspector is able to do a better job of inspection, a better job of selling the idea to potential consumers, is better able to recommend safe wiring, more convenient wiring and a service to his citizens whereby they may secure safety, convenience and get the most user satisfaction for their money.

The sponsored program is only a stepping stone in the direction of securing nationally, the right kind of wiring. Continued efforts from all the industry together with the sincere efforts of the electrical inspectors is certain to bring about a final result that will be a monument not only to those of industry, but to the inspectors themselves.

Contractor . .

By D. B. Clayton
President, Southeastern
Industrial Chapter, N.E.C.A.

THE drying up of that stream of new private construction, during recent years, that flowed so steadily and satisfactorily immediately prior to and during the "twenties," has turned the eyes of the electrical industry towards new horizons in search of new business.

This search was rewarded first in the residential field, where the Better Light-Better Sight, Kitchen Modernizing, and Adequate Wiring Campaigns have produced extremely satisfactory results.

However, there is a large group in the industry who are not able to share properly in this type of work and they have to look elsewhere for new fields in which to expand.

Preliminary surveys of a very casual nature into the possibilities of promoting modern wiring in the commercial and industrial field is a problem that should be given profound study by the entire electrical industry. There is sufficient business to last the industry for years in a modernization program directed toward the commercial and industrial field.

Mr. Bommer

Mr. Clayton

With the small amount of new plant construction going on at this time, it is imperative that some means be developed for opening up this broad field. Every member of the industry should be interested for the manufacturers and jobbers need outlets for their materials, the utility is interested in the more extensive electrification of industry, and the industrial contractor is interested in obtaining the rewiring and modernization work involved.

There is definitely a job to be done and hundreds of reasons for doing it. Conditions at this time are particularly favorable for a great movement in the electrical industry to rid the industrial plants of this country of "antiques"—luxuries that few industrialists can well afford. This is so self-evident that we can look for this movement to start rather actively within the present year and we can expect to have it enthusiastically accepted as a "program" by all divisions of our industry. Of course, it will be eagerly welcomed by progressive industrial plant operators.

It is evident that the proper approach to this broad field of business is through the management of the industrial plant. Through his office comes the decisions on budgets and operations; the studies of efficiency of personnel and equipment; and the final decisions as to what amounts are justified for correcting inefficient methods and conditions.

However, the average plant manager has little electrical training, especially of an engineering nature, and as a result has little idea of the losses he may be experiencing through inadequate wiring and obsolete equipment. But the plant manager is a reason-

(*Continued on page* 20)

More Appliance Sales Promoted Through Wiring Adequacy

THE value of adequate wiring to the appliance dealer is demonstrated spectacularly by the experience of Electric Household Appliances, Inc., of Dallas, Texas. This aggressive firm, headed by Fred Staehle, Jr., recognizing the fundamental need of adequate wiring, has concentrated particularly on sales for installation in houses under construction, when wiring plans may be revamped to provide the adequacy so essential to the use of all-electric kitchen appliances, attic fans and other equipment.

A measure of the success achieved in this effort is indicated by an order recently obtained from Hickey & Company, Dallas builders and engineers, for one hundred complete sets of electrical equipment. This order, covering equipment for one hundred houses under construction, included for each house an electric sink with dish-washer and garbage disposal unit, attic ventilating fan, silent mercury switches throughout, and circuit breaker type distribution panel.

These homes are being constructed in Parkdale, a sub-division east of the city of Dallas. One of the remarkable features of this development is that the houses, including lot and electrical equipment mentioned above, are selling for $3,985.

Homes Quickly Sold

The sub-division was opened after the first six houses had been completed. Considerable publicity was given the venture and thousands of people visited the homes on opening day. All six houses were sold that same day, and other houses completed since have been sold practically as soon as completed.

Another outstanding builder, Flippen-Prather Realty Company, who has been building homes in the $7,000 class, has purchased complete electric kitchen equipment from this aggressive appliance dealer for each new house

Fred Staehle, Jr., president of Electrical Household Appliances, Inc., of Dallas, Texas.

completed. Into these houses go an electric refrigerator, range, dishwasher, garbage disposal unit, metal kitchen cabinet, kitchen ventilating fan, and an attic ventilation fan. Incidentally, all of this electrical equipment costs the new home owner only $4.45 per month in addition to the regular payment on the loan.

Still another company, whose building program had progressed too far to make its homes all electric, placed an order with this firm for six dishwashers, six garbage disposal units, six sinks and six attic ventilating fans. These were for use in homes in the $4,000 class.

This impressive sales volume in electrical appliances was not the result of haphazard sales effort. Rather, it was the result of a carefully planned and executed sales program, largely the work of an appliance salesman of the firm, J. A. Coffey, who was ably assisted by Mr. Staehle, president of the firm, and Al J. Brock, district manager of the General Electric Home Bureau.

Mr. Coffey began his active promotion of electric kitchens in April, 1938, when he conceived the idea of obtaining FHA approval and financing for all-electric kitchen equipment in new homes. His plan was approved by the FHA and he then began his real job—that of selling a leading builder on the idea.

Having been a top ranking salesman for several years, Mr. Coffey knew his line and was himself thoroughly sold on the all-electric kitchen idea. Although he had tried on previous occasions to promote the all-electric kitchen idea with only meager success, he was determined to put over the program this time and began working on builders, contractors, realtors and architects.

After many unsuccessful visits with builders, Mr. Coffey finally found an interested listener to his plan in Hugh E. Prather, of the Flippen-Prather Realty Company, one of the most aggressive realty firms in Texas.

Mr. Coffey transmitted some of his enthusiasm on the all-electric kitchen plan to Mr. Prather, who decided to experiment with ten houses in the moderate income class. Mr. Coffey cooperated with the architect in drawing up plans for the houses and many of his ideas were incorporated in them.

In addition, the kitchen was truly all-electric, with refrigerator, range, sink, dishwasher, garbage disposal unit, metal storage and base cabinets, mixer, washing machine, ironer, vacuum cleaner, and kitchen exhaust fan. Included also was an attic fan ventilating system, lumiline lighting in the bed rooms, bath and kitchen, and ample convenience outlets throughout the house as well as weatherproof outlets outside.

When C. A. Tatum., sales manager of Dallas Power & Light Company, learned of the installation, he became most enthusiastic about the development and devoted an entire issue of *Dallas Hospitality*, the utility's monthly publication that goes to home owners, to the "Magic Electric Home," as it was designated.

The utility then cooperated with newspaper, radio and bill-board advertising in introducing the

first of this series of "Magic Electric Homes." When the house was finally opened to the public for inspection late in the summer, it was necessary to call on the police department for traffic officers to regulate the traffic that accumulated by early afternoon.

Salesmen from the realty company as well as from Electric Household Appliances were on duty during all of the opening day. Three duplicates of this modern electric home were sold on the opening day, one lot was sold with the builder receiving instructions to include every electrical device in the model home in the plans for the one to be built on this lot, and realty company salesmen obtained enough prospects to keep them busy for weeks.

Sales Closed in Homes

What is perhaps more amazing, salesmen from Electrical Household Appliances, Inc., sold seven refrigerators, two ranges and three attic fans, on the premises of the model home. In addition, they obtained prospects for fourteen all-electric kitchens to be installed in homes already constructed.

The success of the first "Magic Electric Home" resulted in considerable activity on the part of other builders and real estate dealers with whom Mr. Coffey had already been in contact and the Hickey & Company order for one hundred sets of electrical equipment, already mentioned, was one of those that followed.

Electric Household Appliances has capitalized to good advantage the splendid publicity received as a result of these building developments and has inaugurated a co-operative service extended to real estate developers and builders.

One service offered is that of kitchen planning and adequate wiring suggestions. They cooperate with the architect or builder to redesign the kitchen for electrical equipment and work out such changes in the wiring plans as may be required to provide adequate circuit capacity, modern wiring devices, etc. Of course, this service is supplied without cost or obligation.

The firm has been particularly helpful in assisting real estate salesmen to apply specialty sales methods in the sale of these modern electric homes. For example, when a house is completed, Mr. Coffey or other members of the sales staff of Electrical Household Appliances serve during the inspection period and assist in selling the house by discussing and demonstrating the electric equipment, as well as other quality features of the house such as copper piping, adequate wiring, etc.

Even after a house is sold, the firm follows it up by sending a salesman to instruct the owner in the use of the new equipment. New prospects are obtained this way.

J. A. Coffey is shown here with a prospective buyer in one of the hundreds of all-electric kitchens he has sold in Dallas, Texas.

Survey Demonstrates Value of Wiring Adequately

THE influence of adequate wiring on electrical appliance sales is well illustrated by a survey conducted annually by the Electric Service League of Toronto, Canada. Each year, the Electric Service League makes a survey of 100 typical Red Seal homes of recent occupation, and also 100 non-Red Seal homes of approximately the same value.

One of the objects of the survey is to check the influence which wiring, as certified under the Red Seal program of the League, has upon the purchase of appliances. The following tabulation of the results from the 1938 survey illustrates graphically the greater opportunity the electrical appliance dealer has to sell appliances to the occupants of adequately wired homes:

Appliance	Red Seal	Non-Red Seal
Range	94	9
Refrigerator	83	40
Washer	86	80
Vacuum Cleaner	91	64
Ironer	6	5
Ventilating Fan	31	3
Water-Heater	68	12
Grate	34	7
Floor Polisher	13	6
Sewing Machine	22	10
Electric Clock	86	33
Iron	98	100
Toaster	98	99
Percolator	61	33
Fan	39	10
Electric Radio	99	97
Curling Iron	46	37
Portable Heater	34	23
Grill	19	15
Hotplate	14	3
Floor Lamps	284	219
Table Lamps	344	280
Waffle Iron	23	8
Furnace Blowers	32	32
Sunlamp	5	—

Every house needs
Westinghouse
SELLING UP IS EASY!
Yes, the Dictator has every essential standard feature and 9 PLUS features not offered on the lower price Diplomat.

THE PACEMAKER LINE FOR '39

with the RIGHT features on the RIGHT ranges

SELLING UP requires more than an offer of PLUS features. Every model must have the same basic speed, results, and economy features to assure the tops in cooking performance, no matter what model is bought. The 8 beautiful new *Kitchen-proved* Westinghouse Ranges follow through — Solid-Top Corox Units, SuperOven, Single Dial Oven Control, and One-Piece Body are standard on ALL models.

Then, each range also has its own practical *plus* features which prospects quickly appreciate. Stationary Platform Light, Surface Unit Signalite, Minute Minder, Time-Controlled Cooker, Menu Master Broiler Pan — these are typical of the many *Kitchen-proved plus features* women want and you can offer in selling up.

Step up your profits — *sell up* with the star feature Pacemaker Line in '39. See your Westinghouse Distributor or write Dept. 9062, Westinghouse Electric & Mfg. Co., Mansfield, O. for complete facts and advertising and promotional helps.

"GUESS AGAIN"

Streamlined Discovery Demonstration

A proved plan for ringing up **Greater Sales** ...ties right in with the new MKB program

Last fall, out of 184 Discovery Demonstrations checked in a few districts, retailers obtained the amazing total of 3,266 prospects, sold 145 ranges, 22 refrigerators, 54 other appliances *during the demonstrations!* Now the nationwide 1939 *Streamlined* Discovery Demonstration will get even more prospects, make more sales. See the new plan book. Read how you can demonstrate and pocket profits.

GET THE DETAILS of this big profit plan NOW

MODERNIZE ELECTRIFY your KITCHEN

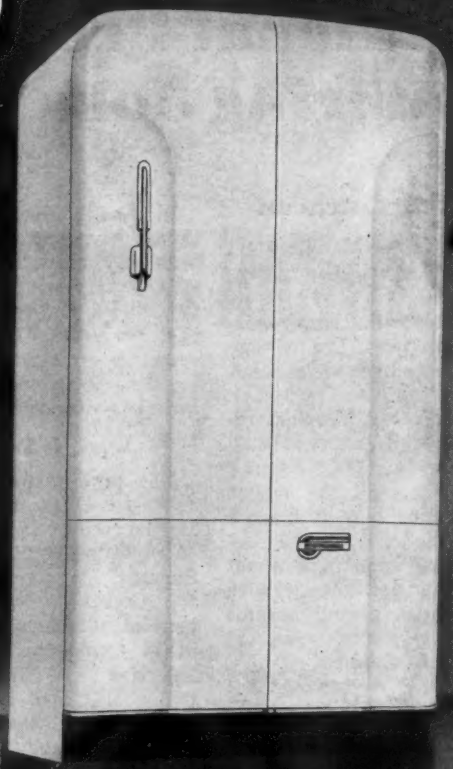
Westinghouse *Kitchen-proved* Ranges

"The Line of Least Resistance"

Every house needs

Westinghouse

A PACEMAKER in Eye Appeal! A SALES MAKER in "Buy Appeal"!



IT'S THE PACEMAKER FOR '39

- BETTER FOOD PROTECTION
- KITCHEN-PROVED CONVENIENCE
- LONG, LOW-COST OPERATION

It's got Everything to SELL... and Everything to SELL WITH!

1939 prospects are looking for STYLE — and finding it in Westinghouse. They also want to know what's INSIDE as well as OUTSIDE — and the 1939 Westinghouse Refrigerator has what it takes to sell them. It makes available a point-by-point presentation that answers every question. The 1939 Plus-Value Visualizer practically takes the 1939 Westinghouse apart for exacting buyers. It shows the *why* and *how* of Meat-Keeper, Humidrawer, exclusive True-Temp Control, Economizer mechanism, and all the other 1939 Westinghouse advantages.

FAST CLOSING IS EASY with the new SELLING BOOK!

Gives a complete to-the-point sales story in big pictures and fast-moving copy that makes it easy to get over the PROOF of *better food protection ... Kitchen-proved convenience ... and long, low-cost operation!*

If you don't already carry the Westinghouse line, it will pay you to investigate the attractive 1939 dealer franchise. Call your nearest Westinghouse distributor or write direct to Westinghouse Electric & Manufacturing Company, Mansfield, Ohio.

NEW PLUS-VALUE VISUALIZER tells the "Inside Story"...

The year's outstanding showroom demonstration piece! It actually lets your prospects see into the new 1939 Westinghouse Refrigerator ... feature by feature, by means of a new ingenious series of Cellophane overlay pictures that dramatically emphasize ALL the "plus values" Westinghouse has to offer!

Westinghouse Refrigerator

"The Line of Least Resistance"

Extending the National Program To Larger Wiring Jobs

By W. P. McCutcheon

Industrial Sales Manager
Birmingham Electric Company

INADEQUATE wiring is an insidious disease to which all electrical systems are peculiarly susceptible. In many cases, inadequate wiring has been a serious detriment to the sale of increased and liberal use of the utility's service. These cases have served to emphasize the growing need for investigation of, and action for, adequacy of wiring in all commercial and industrial establishments. Such steps will pave the way for future sales and, on the other hand, will be doing a real job of improving the service for the customer. This problem has been rightfully named the "bottle neck" of commercial and industrial power service.

Among the many operating advantages of adequate modernized wiring to the commercial and industrial establishment are the following:

1. Prevents breakdowns which retard production and cause labor and plants to lose wages.
2. Prevents losses in lighting and slowing down of the machines as a result of voltage drop.
3. Prevents dissipation of power in the form of invisible heat losses.
4. Lowers maintenance and repair costs.
5. Permits shifting of equipment or installation of new machinery with minimum delay and minimum cost.
6. Promotes safety of employees and lowers insurance rates.

Responsibility for Promotion

It is generally recognized by utilities that the service rendered their customers is only as good as the weakest link in the chain of service. Only too often that weak link is at the division switch between the utility's service lines and the customer's ultimate points of use.

While it is recognized that the utility's responsibility is to deliver to the customer's premises adequate, dependable and economical service of a high quality, this does not mean so much when the customer's wiring system is inadequate to the point that heavy wiring losses, shutdowns, low voltage and poor regulation are of frequent occurrence.

An interruption of service, regardless of what it costs the customer, immediately stops the meter —the cash register of the utility. From this point of view, it appears that the responsibility to the customer for doing something about adequate wiring lies largely with the utility, which should assume the leadership and sponsorship, at least, of a plan of action.

It is generally recognized that one of the utility's best sales allies for this type of work, especially for direct sales effort, is the electrical contractor who is capable of doing the job the customer needs. Therefore, it is believed that the contractor is the utility's best helper in selling adequate wiring.

But this responsibility does not rest entirely with the utilities and the electrical contractors. The manufacturers have good equipment that will meet the needs of adequate wiring and are anxious to sell it to fill that need. They should assist in the sales work, in the education, and in the sales promotion and advertising in order to do a well rounded selling job that will ultimately benefit them as well as the customer.

Mr. McCutcheon discussed this subject recently before the Industrial Power Committee of the Southeastern Electric Exchange at a meeting held in Atlanta, November 11, 1938. His suggestions should prove of particular value to utilities and contractors endeavoring to find a logical approach to the solution of this problem.

In a sales promotion and advertising way, one manufacturer has been very active in selling the idea of adequate wiring to industries, to utilities, and contractors for the past two years. They have offered reprints of their advertising to serve as direct mail pieces in the interests of adequate wiring.

What Is Being Done

The same manufacturer has developed two important books in the furtherance of the campaign. One of these called "Industrial Wiring Surveys" is particularly suitable for use in industrial and commercial establishments; the other is an "Industrial Guide For The Selection Of Wiring Cable." These two books have been used extensively by utilities' representatives and contractors in an effort to serve the industrial and commercial customer on the needs of adequate wiring, after first checking carefully the conditions of their entire wiring systems. Direct mailing pieces referred to above have been distributed among commercial and industrial customers by many utilities. Direct sales effort in the field has been directed toward the education of the customer as to how his wiring needs may be determined and how to plan for the future.

While the above items cover, to a certain extent, some of the activities that have been undertaken to meet the problem of inadequate wiring, it is believed that a more unified effort on education will be required before any degree of success is realized. The National Adquate Wiring Bureau has set up a program of national scope to emphasize the need of better wiring in the residential field. A large number of electrical leagues are tying in with this National Bureau's program and it appears that much good will come out of this important cooperative activity.

Such an activity is now being considered by this same Bureau for promoting adequate wiring

(*Continued on page* 22)

Go Modern All the Way"...by Selling

1939 Hotpoint

ELECTRIC RANGES

HERE'S REAL SALES POWER FOR YOU

NATIONAL ADVERTISING

Hotpoint advertising ties up with the big Modern Kitchen Bureau "Guess Again" Campaign in the Saturday Evening Post. In addition Hotpoint advertising will also appear in five other national magazines through your heavy selling season, carrying the story—"Be Thrifty, Be Modern and Go Modern all the Way on Cooking."

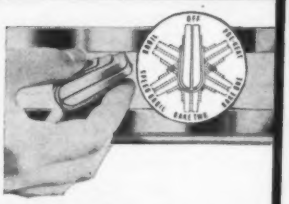
MODERN KITCHEN BUREAU CAMPAIGN

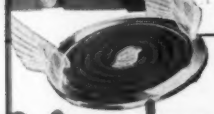
Hotpoint offers material to help bring the big "Guess Again" Campaign into sharp selling focus for you. Tie up with the M. K. B. Spring Drive. Use Hotpoint's Spring Swing Sales Plan. Material can be adapted to your individual needs. Newspaper mats, posters, direct mail, window and store display for spring sales activity now ready.

HOTPOINT RANGE FEATURE HELPS YOU SELL!

DIRECTIONAL HEAT OVEN

A big selling feature that wins customers—provides a variety of oven heats—five separate controls with one switch. Permits baking or roasting from a cold or pre-heated start. Two intensities of heat available in top units gives duo-speed broiling for steaks, chops, fowl.





Calrod COOKING UNIT TARGETS THE HEAT

1 Calrod heat is efficiently, effectively applied. It is used entirely for cooking.

2 Calrod heat is conducted through bottom of pan into food. There's no flame.

3 Calrod heat is accurately controlled. Five different heats from one switch.

New Features— New Models and a Great New "Battlecry"

Go modern, sell Hotpoint and get your share of the big volume of range sales that is predicted by electrical men everywhere.

Hotpoint's 1939 models are loaded with sales features that get orders. Five Speed, Select-A-Heat Calrod and Directional Heat Ovens give new economy arguments for range salesmen.

And the great new battlecry set up for range salesmen is—"Go Modern all the Way on Cooking." Story is—"Electricity is the *modern* fuel. Buy a range that is modern in method as well as appearance." Get all the facts about Hotpoint's new models, new features, new plans. Swing ahead with Hotpoint—The Headline for '39.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5614 West Taylor Street, Chicago, Illinois

Lighting Offers Ideal Approach For Industrial Rewiring

By Roy A. Palmer

Illuminating Engineer
Duke Power Company

ALTHOUGH the program of the National Adequate Wiring Bureau covers only residential wiring at present, the electrical contractor can apply the same promotional principles advantageously in the commercial and industrial field. In this connection, many electrical contractors are learning that the acceptance for lighting improvement that is being established so effectively among industrial operators through the Better Light-Better Sight program offers a splendid opportunity for the sale of modernized wiring by tying in its appeal with that of better lighting.

Although modernized wiring possesses many splendid sales appeals from the viewpoint of economy, convenience, and safety, it lacks the spectacular and tangible appeals to be found in improved lighting.

In commercial and industrial establishments lighting improvement paves the way for changes in wiring because the higher wattage lamps necessary for that improvement will invariably necessitate heavier copper, more circuits, larger panel boards and other additions to the wiring system. Once the subject of wiring has been brought up for discussion as an essential to better lighting, it becomes a relatively simple matter to sell the industrial plant operator on the economy and advantages of adequate wiring for his entire plant where a complete survey of loads and voltage drops indicate that changes are desirable and justifiable.

Thus the lighting story which already has an acceptance can definitely lead to more wiring business for the electrical contractor.

Promoting the combined sale of better lighting and modern wiring, one finds an almost unlimited field among industrial plants. In spite of all that has been accomplished in industrial lighting during the last twenty years, an industrial lighting survey completed recently by the Committee on Industrial and School Lighting and the Committee on Lighting Service of the Illuminating Engineering Society indicates an appalling lack of proper lighting.

Investigations in some 2,500 industrial plants showed an average illumination level of but 2.85 footcandles. The average age of all industrial lighting equipment found was 8.7 years and the average number of watts per outlet was 121. It is quite evident from these figures that the prevailing lighting conditions in industry are much below those which should be in use if good seeing conditions are to prevail.

Industrial Field Unlimited

Fortunately, there are many encouraging exceptions to the average conditions quoted above and, the fact that these few well lighted plants are fairly well distributed and that one or more can be found in nearly every industrial center, makes the selling job of the electrical contractor less difficult. Complete information on other well lighted plants in the immediate vicinity supplemented with photographs and testimonials as to improved working conditions, reduced spoilage, and increased safety, will furnish the electrical contractor with splendid sales ammunition.

The seeing task involved in most manufacturing plants may vary considerably with the type of work done, but the principles of good illumination are fundamental. Most intelligent industrial plant operators are quick to grasp the advantages of better lighting as applied in their own field even though the contractor presents his story by referring to an adequate installation in a plant of an entirely different type.

Perhaps the far-reaching effect of such comparisons is well demonstrated in the case of a North Carolina mill executive where the sale of a modern I.E.S. type floor lamp for use in his home resulted ultimately in the sale of a 60-kilowatt totally indirect lighting installation in a new hosiery mill which he was constructing. The nightly use of his indirect-type floor lamp so impressed this mill executive with the advantages of this type of illumination that he decided to employ the same type of lighting in the new plant he was building.

The tying in of the sale of better lighting along with that of modernized wiring has another important advantage for the electrical contractor who specializes in the industrial field. Obviously, large industrial jobs are not sold through a single call and the contractor who finds it possible to confront his best industrial prospects with an intelligent presentation at frequent intervals will find the sales resistance of his prospect gradually diminishing. In this connection, he will find that the subject of lighting will supply him with an infinite amount of sales ammunition as a basis for such calls.

No phase of the electrical industry has been developed more rapidly than that of lighting during the past few years. Each new development presents new opportunities for application in the industrial field. One needs only to survey briefly the development in this

field during the past year to realize what rapid progress is being made in the field of industrial lighting.

The past year has seen such new developments as:

The so-called large area, low-brightness fixtures utilizing silver bowl lamps and special louvers to reduce neck brightness.

The new fluorescent lamp in daylight color in color matching fixtures.

New industrial lighting equipment adapted for use with medium bipost base lamps which are now available for general lighting service in the 1000, 750, and 500-watt sizes.

Improved mercury lamps and combination mercury and incandescent lamps as well as improved auxiliaries.

Increased efficiency in fixtures covered by RLM specifications.

The successful use of sodium and mercury for floodlighting and the increased use of outdoor floodlighting for safety as a result of labor troubles and strikes.

Ideal Sales Approach

Each of these developments will find many specific applications among industrial plants and will supply the electrical contractor with logical reasons for further calls on his best industrial prospects.

Many electrical contractors have hesitated to canvass industrial plants aggressively on the subject of modern lighting because of their limited technical knowledge in this field. In the larger firms, it is possible to designate some key man who can familiarize himself with the subject of industrial lighting. Such a man will find much information available from manufacturers and will find the lighting personnel of the local utility particularly helpful.

The smaller electrical contractor whose staff does not include a man of the proper qualifications and who finds it necessary to devote so much of his time to his contracting business that there is little time left for the study of lighting theory and application, will find the local utility's lighting engineers more than willing to assist him in preparing layouts and presentations for industrial plants whom he has developed as prospects for relighting and modern wiring.

In selling wiring through the medium of improved lighting, the light meter is still one of the most effective means of creating interest and showing why better lighting is needed. In spite of this fact, there are still many contractors who do not possess these meters, and who have not appreciated that the meter is a means of creating lighting prospects.

Incidentally, this light meter can be used effectively for creating wiring prospects also. To adapt the light meter for this use, a small, handy and very inexpensive device has been developed which consists of a short tube closed at one end in which there is placed a carbon filament lamp. The tube is designed so that it will fit snugly against the meter directly over the light cell.

Light Meter Helpful

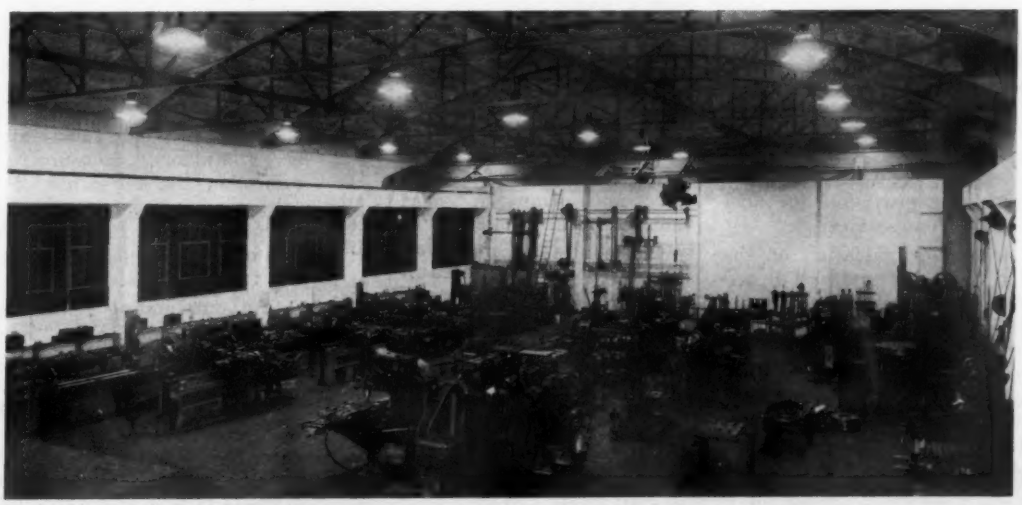
Because one of the characteristics of the carbon filament lamp is that the brightness of the lamp varies with the voltage impressed upon it, the footcandle scale of the light meter may be calibrated to read directly in volts.

With this simple auxiliary, the light meter can be made to serve as an inexpensive, portable voltmeter. By plugging in the cord connected to the carbon filament lamp, the voltage can be read at the panel board, or at any socket or other outlet.

Many contractors have improvised useful, portable sales kits including both light meter and voltmeter mounted in a single carrying case and equipped with connecting leads of proper length for the voltmeter. By making a careful survey with this equipment, the contractor can present the plant operator with a very exact picture of voltage conditions and illumination levels throughout the plant.

In few instances does the industrial customer realize that voltage drop decreases very materially the light output of lamps. Or that

(*Continued on page* 32)



There are hundreds of industrial plants in the South that await the efforts of some aggressive contractor to sell their owners modern lighting and adequate wiring. To the machine shop shown above, the contractor sold 21 high intensity mercury vapor lamps and a modern wiring system. The 33% increase in production reported by the owner helped to sell other industrials.

Selling Adequate Wiring

This aggressive contractor's promotion succeeded despite lack of local bureau

LACK of an organized local promotion of the National Adequate Wiring Program has been no handicap to the Fair Electric Company, of Tuscaloosa, Alabama. The experience of this contractor-dealer indicates that there are splendid opportunities in scores of smaller communities for individual sales promotion by local contractors, utilizing the materials offered by the National Bureau.

The value of the program as a selling keynote, whether backed by an organization or not, was immediately apparent to Oscar Fair, proprietor of the Fair Electric Company, who decided that his business, embracing as it does both wiring and the retail sale of appliances, was in an excellent position to use the adequate wiring message to develop both phases of his business.

One of Mr. Fair's first maneuvers was to campaign for more active enforcement of the city's electrical ordinance, which in itself provided many desirable objectives of the adequate wiring program including complete inspection service. As a result of these efforts, the city now has an electrical inspection service and is properly enforcing the ordinance.

The Alabama Inspection and Rating Bureau, which in a previous report had directed attention to many deficient electrical installations in Tuscaloosa homes and business establishments, pointed out in its last report that new wiring is being properly installed since the city made provision for adequate inspection service.

The sales organization of the Fair Electric Company was turned into an adequate wiring sales force as well as an appliance sales group; all outside and contact employees were educated in the advantages and need for adequate wiring, and a word-of-mouth job of institutional advertising was carried on through every call.

Appliance salesman, it was pointed out, have an excellent opportunity to discuss the wiring efficiency of a home with its mistress, and to explain to her in understandable terms why the new refrigerator she is thinking of buying would not operate successfully if connected to too small a wire, or why she should not connect the radio, two lamps, and a vacuum sweeper from the same single outlet.

Canvassing, always necessary to successful appliance merchandising, was made to embrace wiring and repair work, with excellent results. As many as 50 repair jobs have come to the Fair Company in a single week and a decidedly increased volume of new building wiring has been contracted by them. Thirty-eight new residence jobs have just been completed and the company now has contracts to wire or rewire twice that many more. Mr. Fair endeavors to obtain such contract business above competitively bid jobs for it is then relatively easy to provide for an adequate installation from the outset.

In addition to their appliance sales manuals and literature Mr. Fair's salesmen carry literature furnished by the National Adequate Wiring Bureau and merchandise it as actively as they do any of their electrical products.

The National Adequate Wiring motif has prevailed in the extensive newspaper advertising sustained by the Fair Company with frequent large ads devoted entirely to adequate wiring. Use is made of reference installations whenever possible. For instance, upon the completion of the new Bama Theater, which incorporated quite an elaborate electrical lay-out, Fair tied in a good-sized ad with the theater's opening, announcing: "We installed the fixtures and aided in inspecting the projector equipment in the new Bama Theater. Dependable, competent workmanship was required. Congratulations to the management . . ." Other copy pointed out the advantages of using equipment parallel to the adequate wiring requirements.

The seed sown by an appliance salesman upon delivering a new appliance frequently bears fruit later in a wiring repair job. If an appliance does not function entirely satisfactorily, consumers often remember the comments of Fair's salesman that inadequate wiring might easily cause such difficulty, and call the company in to correct the faulty condition.

"An outstanding feature of our success," said Mr. Fair, "is our repeat business. After installing a machine or an electrical appliance, or wiring a home, we always call back later to see if operation is satisfactory. If there is something wrong, we undertake to find out what it is and to correct it."

The company plans to continue its active selling of adequate wiring through 1939, using more N.A.W. literature, and direct mail pieces furnished by the Bureau.

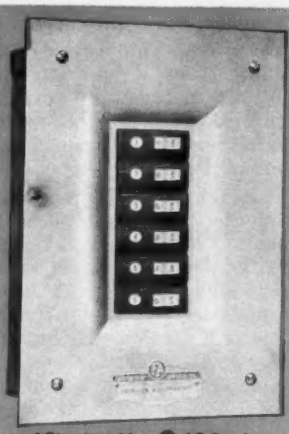
National Bureau Offers New Materials

THE reception accorded the National Adequate Wiring Program's basic materials indicates that they will continue to be generally useful for some time to come. New materials, therefore, have been planned to supplement what is already available.

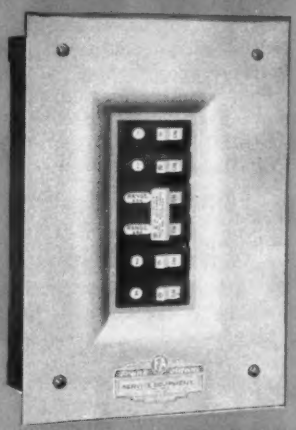
Of particular interest to electrical contractors who have used the direct mail campaign pieces to advantage is the complete "Contractors' Sales Plan" now available from the National Bureau.

Providing a full planning service for residential work, this material includes two basic pieces. One piece, a four-page folder, provides a means of leaving with a prospect a complete plan or proposal. Headed "This Wiring Is Hand Tailored for You," the prospect is warned on the first page that if he should secure another bid, he should ask the other contractor to figure on this same plan

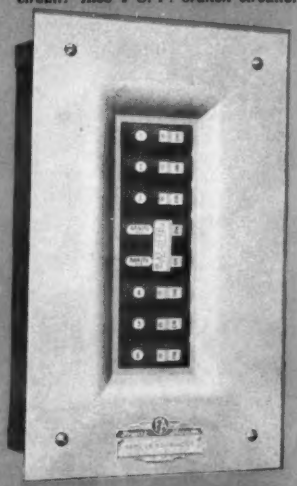
(*Continued on page* 20)



6 Circuit and less (FA) AC Service Equipment. Main lugs.



(FA) Service Equipment with (FA) D. P. 35 Amp. AC Circuit Breakers for range circuit. Also 4 S. P. branch circuits.



(FA) Service Equipment with D. P. 50 Amp. AC Circuit Breaker Main and 6 S. P., AC Circuit Breakers of capacities required.

EST. 1891 THE SIGN OF A FA BETTER JOB

Frank Adam

AC SERVICE EQUIPMENT

FRANK ADAM ELECTRIC CO. ST. LOUIS, MO. U.S.A.

GREATER CONVENIENCE TO USERS Makes It Easier to Sell More New (FA) AC Circuit Breaker Service Equipments

The complete line of NEW (FA) AC Circuit Breaker Service Equipments gives the contractor a new avenue for added profit—because owners quickly appreciate the greater convenience and high-grade appearance of these new units.

(FA) Service Equipments are furnished for 125 volt AC service, with main lugs, up to 6 circuits in accordance with National Electrical Code requirements. The circuit breakers are single pole for lighting branch circuits or double pole for range, water heater, or sub-feeder circuits to load centers in other parts of the building . . . They can also be furnished with main circuit breaker with any number of branch circuits within National Electrical Code limitations.

Here are some of the advantages you get:

(1) Owners' and Architects' acceptance—more satisfied customers

(2) Accurate quotations on time—when you need them

(3) Prompt deliveries on the job—no lost time

(4) An accurate fit on the job—standardized construction—no "lost motion"

(5) A safeguard to the Contractors' good will and reputation

(6) Immediate deliveries from wholesalers' stocks.

See your nearest Wholesaler or write now for complete information and details on the new (FA) AC Circuit Breaker Service Equipments.

Frank Adam
ELECTRIC COMPANY
ST. LOUIS

FA TRADE MARK PRODUCTS .. "The Sign of a Better Job"

National Bureau Offers New Sales Materials . .

(*Continued from page* 18)

and specification in order to make certain that he is not being offered inadequate wiring. It is also suggested to the customer that when the wiring is completed and ready for inspection, that he hand this proposal to the inspector and ask him to determine if the work has been done correctly and completely according to this plan.

The two inside pages of the folder are ruled to facilitate making a sketch of the house plan and the proposed wiring. At the bottom of the pages are the conventional symbols for various types of outlets and other electrical equipment. The last page of the folder includes a brief specification of the wiring with blanks to be filled in so as to include the specific features of the plan proposed.

The Bureau has prepared another folder which gives the contractor complete information as to the best plan of utilizing this material as well as a suggested proposal form.

The consumers' folder, "Check Your Wiring," which presents the complete National standard for home wiring adequacy can now be followed up by the presentation of a dramatic application of the standard to typical homes of varied sizes, types and styles. Photographs, sketches and plans of six houses of popular and distinctly different styles of architecture have been loaned by six national women's magazines for publication in a booklet titled, "Modern Home Planning." A leading national builders' magazine has contributed illustrations of details on adequate wiring. It is anticipated that the public will give this booklet a warm welcome and will value it as a useful reference.

Current newspaper advertising material will be supplemented with a set of graphic illustrations of adequate wiring's strongest selling points in mat form. Now available, also, is a twenty-four sheet billboard poster with good long range visibility and readability. It makes use of the same design used so effectively on the window display posters.

Another important addition to the adequate wiring material offered by the National Bureau is a leaflet suitable for general distribution to the public attending educational meetings where the adequate wiring chart is discussed. The contents of the leaflet include a reproduction of the floor plan on the chart, complete condensed standards for adequacy, reasons "why" for adequate wiring, and full directions for a self-conducted survey of a home's wiring system.

A booklet of humorous cartoons, so popular today, is to be made available both for direct distribution and for use in advertising.

Of particular interest to local promotional bureaus adopting the certification plan will be the uniform record forms now available for recording the data obtained in wiring surveys, and for maintaining accurate records of actual results obtained in the local campaign.

Contractor's Viewpoint On Wiring Campaign .

(*Continued from page* 9)

able man and is intensely interested in operating economy. In most cases, it is only necessary to present a true picture of the conditions that exist in order to sell the plant owner on a modernization program.

The average plant manager, probably, does not know that when he adds increased wattage on his lighting system and lowers the voltage of the outlets by overloading existing wiring that he greatly reduces the light available from his system and increases the current losses. For example, in a typical instance, a loss of 10 volts in outlet voltage reduced the illumination level 31 per cent and increased current losses 15 per cent.

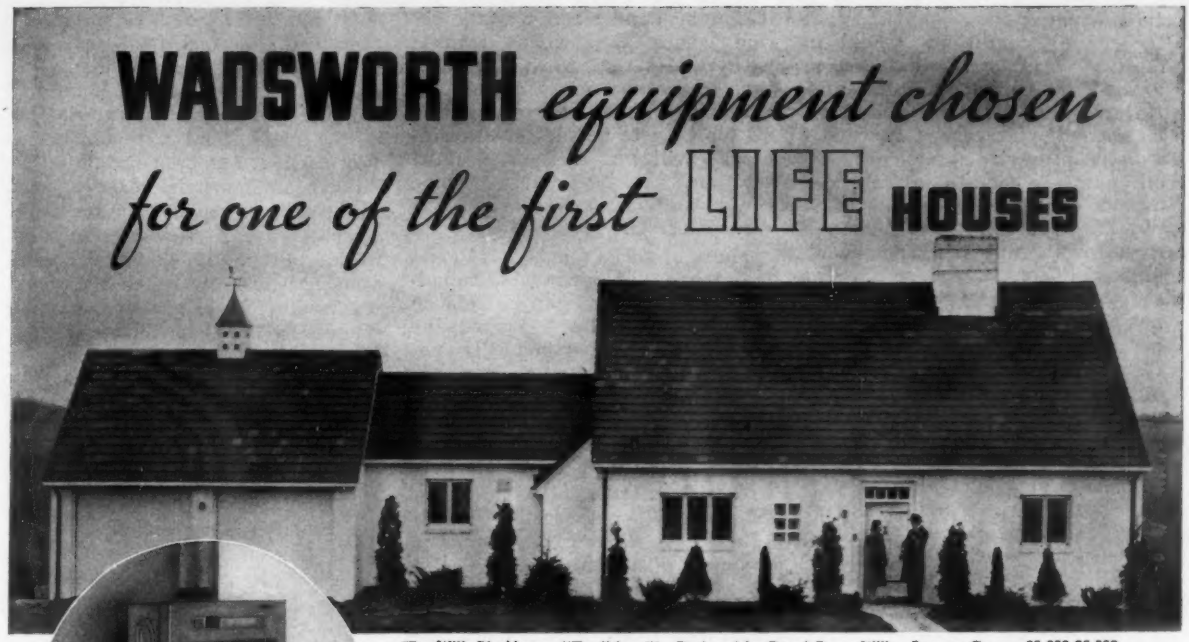
In the case of a power load, for another example, a 50 horsepower motor operating approximately forty hours per week at an average load of 90 per cent would cost approximately $100 per month for electric service. If the circuit capacity serving this motor was so small as to cause a drop in voltage of 10 volts at the motor, the cost of the energy losses would amount to $8 per month or nearly $100 per year. On the other hand, to increase the copper in a circuit to the size necessary to limit the voltage drop to only three volts would require an increase of not more than three per cent in total installation cost if done when the installation is first made.

This cost would vary with the location and types of control used but the additional three per cent, probably, would amount to from $7 to $12. Of course, this would be greatly increased if the old circuits have to be taken down and replaced by larger wire and conduit, or even if parallel circuits are installed to reenforce the existing circuits.

While the above figures are approximate and do not apply to other than average conditions, they show that figures can be ar-

"Don't you think Snodgrass is over doing this safety business?"

WADSWORTH *equipment chosen for one of the first* LIFE HOUSES



The Wills-Blackbourn "Traditional". Designed by Royal Barry Wills. Income Group, $5,000-$6,000.

Adequate wiring is the keynote throughout this Wills-Blackbourn "Life House" shown above.

Electrical Installation By Ross Electric Co., Pittsburgh, Pa.

LIFE'S EDITORS call it the Wills-Blackbourn "Traditional" . . . located in beautiful Baldwin Manor, suburb of Pittsburgh, Pa. Wills-Blackbourn "Traditional" is one of 8 model homes sponsored by "Life", and designed by 8 Nationally known Architects.

Throughout the United States many of "LIFE HOUSES" are NOW under construction. These homes provide every modern convenience without sacrificing any of those "Homey" features so essential to Family Comfort . . . and friendly hospitality.

The selection of Wadsworth equipment for the Wills-Blackbourn House shown above is a genuine tribute to the dependability . . . and satisfactory performance of WADSWORTH'S products.

Photographs Courtesy Life Magazine

The Koch-Ramsey "Traditional".
Designed By Richard Koch.
Income Group . . . $2,000-$3,000.

The Embury-Smith "Traditional".
Designed By Aymar Embury.
Income Group . . . $10,000-$12,000.

The Kelley-Calvert "Traditional".
Designed By H. Roy Kelley.
Income Group . . . $3,000-$4,000.

Whether it be cottage or castle, there are suitable *Wadsworth* devices to meet the requirement. Electrical Contractors know they can depend on *Wadsworth* products. They do not hesitate to recommend them for use where the conditions are most exacting.

BUY WISELY . . . BUY WADSWORTH, "THE PROFIT LINE FOR '39"

The WADSWORTH ELECTRIC MFG CO. INC.

Covington, Kentucky.

rived at on specific jobs, and that the actual conditions would in most cases prove very interesting to the man who is paying the bills. Naturally, it will take some time to make the necessary survey of a plant and arrive at figures based on operating conditions that exist over a period of time, but there are ample possibilities for business to warrant the time spent, and the competitive conditions surrounding work of this kind are not nearly as discouraging as they are where work is thrown out to all contractors by architects and engineers, many of the bidders not even being familiar with the type of work that they are attempting to estimate.

Plant management is not always to blame for the conditions existing within their plant, for they are not engineers by training, and it is the business of the engineers and the contracting engineers to inform them regarding the troubles that are plaguing their cost sheets often without their knowledge.

The average industrial plant, as old as ten years or more, is usually antiquated as to electrical installation, particularly the wiring system. The average plant starts small and grows as the fancy or money of the owner, or the necessities of its particular trade, seem to dictate. At the start, when funds are probably not plentiful or the owner not too certain of success, the electrical system is looked upon as a necessary and expensive evil, and it is cut down to the barest Code limits either by an uninformed owner or an ignorant contractor; sometimes both.

As the business grows, additional machines are needed and the electrical load is increased. As a rule, these increases are in such small amounts that the owner decides on each occasion that the existing system will carry the small additional load and, therefore, the only money spent for wiring will be the small amount used to connect the new motor to the existing feeders at the nearest point.

This is especially likely to happen where a fairly large amount of power is already in use and when the installation of the new equipment is made during a rush period with the plant operating at full capacity. The management does not feel like stopping long enough to rebuild the feeder system at such a time, thinking that it can be done when a slack period comes along. The trouble with this is that when the slack time does come, many of the machines are closed down and it is all too easy to decide that the increase will not be needed until the plant gets busy again. Thus, the situation develops into a vicious circle.

Many of these plants have good maintenance departments, including personnel who can be sold on modernization. But too often, the maintenance department is not much more than a name in so far as engineering experience is concerned, and their ability extends no further than the maintenance of equipment already installed.

Often a new installation in the hands of the mainteance department is handled in a temporary manner with materials on hand, with the honest intention of making a permanent installation at a later date when there is more time to get proper materials and install them. Too often, the temporary wiring becomes permanent and another troublesome factor is injected into the system to cause loss and perhaps troublesome shutdowns during a busy period.

Extending the Wiring Program to Industry

(*Continued from page* 14)

among commercial, industrial and government and municipal establishments. If this plan materializes, it should play an important part in educating this class of customers on the need and advantages of adequate wiring.

While the problem is a simple one for contractors serving the residential field, it becomes a technical and complicated problem for commercial and industrial establishments. It seems, therefore, that the average electrical contractor cannot be relied upon to do this type of work. A special list of contractors that are capable of handling this work should be made and plans formulated in cooperation with the utilities to sell such jobs to commercial and industrial establishments by means of a sales story that is easily understood by the customer.

The world's best prospect for adequate wiring may not know just what a main switch is; or a feeder circuit from a branch circuit. Therefore, it is necessary to simplify the sales language in order to convey the real facts on adequate wiring to the customer.

The average industrial plant of any size has an electrician who is in the main sense a repair man. Too often, it has been the practice in such an industrial plant to use this electrical repair man for construction work. New construction work, although electrical, can seldom be installed by an electrical repairman economically, even though he be an efficient one in his line.

Electrical contractors of the better type are construction men and can handle such jobs efficiently and economically for industries much more satisfactorily than their own men and usually at much less expense. Some cooperation on the part of the utility in bringing this idea to the industrial customers seems desirable and likewise will obtain the full cooperation of those contractors that are qualified to do that type of work. Cooperatively, the utility and the contractor can render much better service to the customer than could be done otherwise.

It is suggested that in a large number of cases the first point to tackle in an adequate wiring job would be to see that the main switch capacity is adequate and sufficiently large to allow for expansion. Once this step is taken, the remainder of the job is greatly simplified.

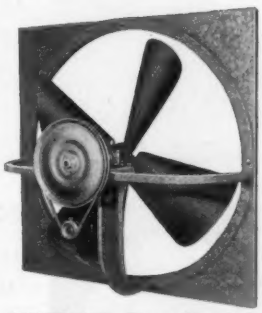
We have mentioned cooperation between the utility, the contractor and the manufacturers of wiring and control equipment. It seems that utilities should also cooperate to the extent that a unified plan of action be adopted.

To do any selling job successfully, there must be a program that will include sales promotion and advertising designed to educate and break down sales resistance. The utilities of this district may wish to study this problem for the purpose of formulating a program which will be recommended to each utility for active support.

Such a program could include cooperation with the National Adequate Wiring Bureau and make use of such advertising as may be made available through it for the purpose of education. Last but not least, serious thought should be given to suggestions for the best plan for direct sales effort.

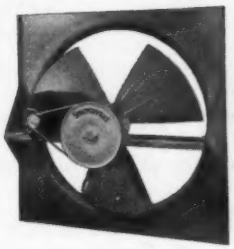
AIR COOLING EQUIPMENT

DIEHL *Air Circulators*: 20", 24" and 30" sizes. Single and two-speed oscillating and non-oscillating models. Floor, counter, wall and ceiling.

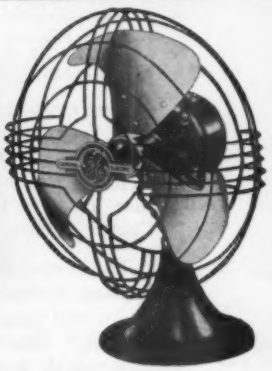


"BUFFALO" *Breeze-Air Attic Fan for home comfort cooling. A large capacity fan that is unusually quiet and economical in operation.*

SIGNAL'S *new Deluxe 16" Streamliner heads its 1930 line of Desk Type Fans available in a range of sizes from 8" to 16" in both AC Induction and Universal models.*

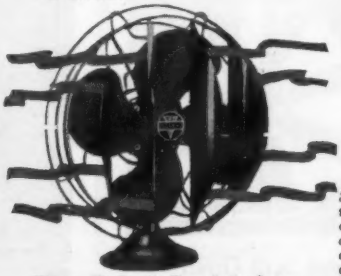


STURTEVANT *Atticvane Fan. Sizes from 24" to 48". Capacities from 2880 to 20,000 c.f.m. No radio interference, quiet operation, adjustable sheaves.*



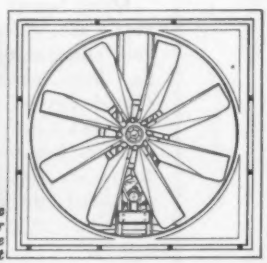
GENERAL ELECTRIC *large Super-Quiet Fan that provides large volume of air movement with amazingly quiet operation.*

GREAT NATIONAL *Golden Eagle Evaporative Cooler—Model 35 will cool space 40'x20'x12'.*

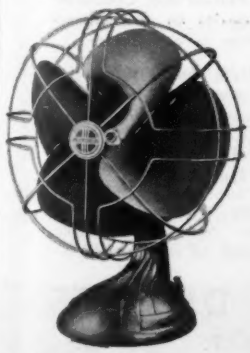


Victor No-Draft Fan featuring the sensational new "Miracle Breeze" Ribbon test proves amazing no-draft performance.

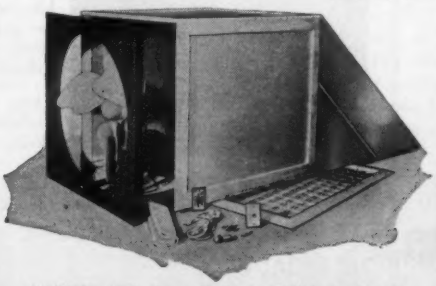
SAMSON *Safe-flex rubber - bladed air cooler. Ideal for home and office use. Silent and economical in operation, streamlined and styled to stay modern. Rubber blades can't hurt a kitten's paw.*



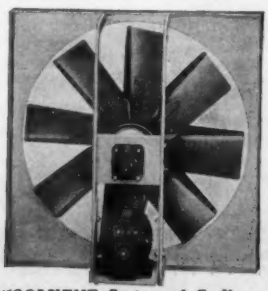
The improved COOLAIR home cooling fan in its exclusive spring mounting. Re-designed and more attractively priced.



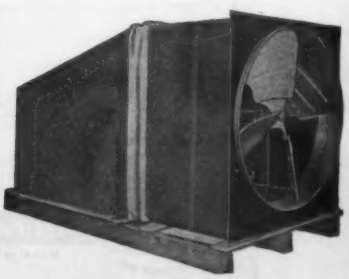
WESTINGHOUSE "POWER-AIRE—*with Ultra-Quiet Micarta blades, current-saving Capacitor motor, and Hamor bronze finish. Provides "Hushed Coolness" for home or office.*



VIKING Attic Fan Package. Efficient streamlined design, with many new features. Complete kit includes all parts for quick, easy installation. Capacities 7,500 to 16,500 C. F. M.

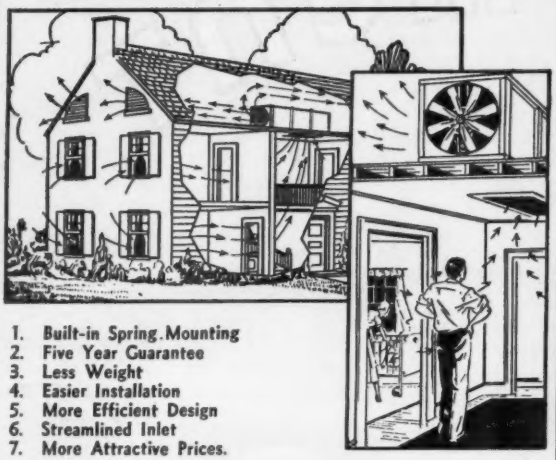


COOLVENT System of Cooling and Ventilating. Capacities 3800 to 18,200 CFM with exceptionally quiet operation.



REX AIRATE new attic ventilators. Complete, ready to install, with automatic ceiling shutters. Quiet and economical in operation.

NEW COOLAIR FEATURES
MEAN EASIER SALES AND GREATER PROFITS

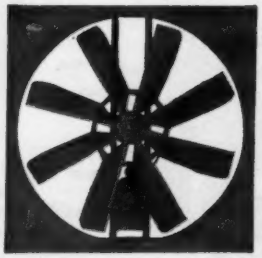


1. Built-in Spring Mounting
2. Five Year Guarantee
3. Less Weight
4. Easier Installation
5. More Efficient Design
6. Streamlined Inlet
7. More Attractive Prices.

Here's a new, vastly improved Coolair fan that will send your summer profits skyrocketing. These outstanding new features, plus more advertising, eye-stopping window displays and new, hard-hitting literature, mean a brilliant year of sales and profits for Coolair dealers.

The remarkable new feature of built-in spring suspension, exclusive with Coolair, sells the fan on sight . . . . and means easier installation and more profits for you. Special oversize ball bearings in fan hub, economical, long hour service motors, efficient belt drive and precision engineering throughout have made Coolair lead the home cooling field for 11 years.

Many homes and business establishments in your community will soon be live prospects for Coolair fans. Get set now for the rush of hot weather business. Write today for full details on excellent dealer opportunities.



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MAIL THIS COUPON TODAY!

Please send me information on the new Coolair fans.

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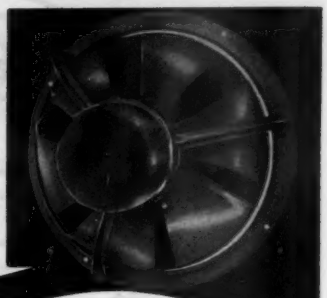
Address _____

City _____ State _____

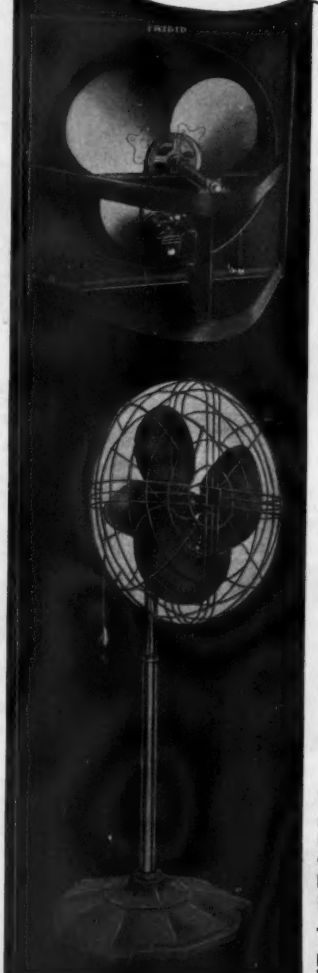
Coolair Ventilating and Cooling Systems

AMERICAN COOLAIR CORPORATION
Manufacturers . . . . JACKSONVILLE, FLORIDA

YOUR LINE FOR '39



FRIGID
AIR CIRCULATORS



MORE FRIGID AIR CIRCULATORS WERE SOLD IN METROPOLITAN NEW YORK IN 1938 THAN ANY OTHER LINE

WHY?

BECAUSE:

LOW PRICED

Unprecedented prices that are so low they minimize customer sales resistance and eliminate competition.

GREATER PROFITS TO DEALER

Low price, beauty of design, efficiency and low cost operation means increased sales volume.

GUARANTEE

Every FRIGID AIR CIRCULATOR carries an unconditional guarantee in performance.

Write today for 1939 catalog showing prices and the complete line including: Floor, Wall, Counter and Ceiling Fans. Attic Exhausts and Fans. Industrial Fans. Exhaust Fans. Blowers.

There are still some excellent profitable territories available. Write today on your letterhead.

CIRCULATORS & DEVICES
MANUFACTURING CORP.
710 BROADWAY NEW YORK, N. Y.

Every house needs

Westinghouse

THE NAME MILLIONS KNOW

means MORE FAN SALES for you!

,000 CONSUMERS WERE ASKED . . .

WHAT DOES THIS NAME MEAN TO YOU?

In 14 scattered cities, some small and some large, men and women were shown a card reading "WESTINGHOUSE" and asked if they knew its meaning. 90% of the answers specifically mentioned electrical products — the majority of them for household use. Projected in terms of voting population, the Westinghouse name is associated with electrical household appliances and related products by more than 60,000,000 people.

Think what this means to *you* when you feature Westinghouse Fans — outstanding leaders in the field for 50 years. It means that the majority of fan prospects in your community are *presold* on the Westinghouse name and quality. They are more likely to come to your store first to buy a fan. Their acceptance of Westinghouse products means that you sell *better* fans, make *more* profit, and create user satisfaction that builds future appliance sales.

Setting the Pace in

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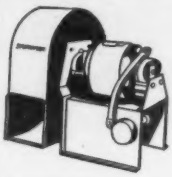
YOUR WESTINGHOUSE DISTRIBUTOR IS BRINGING THIS

COMPLETE FAN SELLING PROGRAM

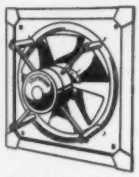
DON'T MISS IT!

Westinghouse *Long-Life* Fans

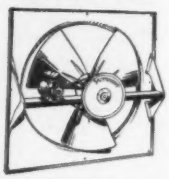
"The Line of Least Resistance"



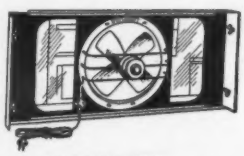
CENTRIFUGAL FANS



PROPELLER FANS



ATTIC FANS



WINDOW FANS

CONSPIRACY?

NO, this is not a conspiracy! It shows how Sturtevant works closely with contractors—assists them to lay out and figure ventilating jobs—to help them land the business.

Call on us for this valuable cooperation. Remember, too, that we—and our distributors, too—carry large stocks of Sturtevant Ventilating Fans to assure prompt shipment.

B. F. STURTEVANT COMPANY
Atlanta, Georgia — Greensboro, N. C.
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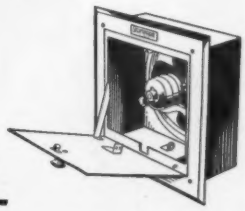
Distributors:
Westinghouse Electric Supply Company
(For North Carolina, South Carolina, Georgia and Florida)
Noland Company, Inc.
(For Virginia)

Sturtevant
REG. U.S. PAT. OFF.
Ventilating Fans



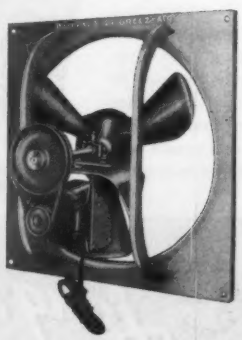
BUILT-IN KITCHEN FANS

Harness the PROFIT of Summer's
HEAT WAVES
with
Buffalo BREEZ-AIR ATTIC FANS

Keep the summer slump away from your door by selling your neighbors what they want most—cool, comfortable homes during next summer's heat waves. And if you want their *lasting* good will, sell them an attic fan that will give them many years of quiet, efficient, low-cost service. Sell them a Buffalo Breez-Air Attic Fan, made by a company that has been specializing in fan engineering and design for over 60 years.

Better Discounts — Better Profits

Because of the growing sales of Breez-Air Attic Fans, we are pleased to announce better list prices, better discounts and profits for qualified distributors and dealers. Write or wire for open territory and full details.



BUFFALO FORGE COMPANY

210 Mortimer St. Buffalo, N. Y.

Branch Engineering Offices in Principal Cities.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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FOR
GREAT NATIONAL'S

GOLDEN EAGLE
EVAPORATIVE COOLING SYSTEMS

This attractive, superlatively performing, quality cooler sells fast.

Tools to work with—Salesman's Manual, a complete story of evaporative air conditioning in simplified terms. 15 years of experience condensed into 36 pages. In addition, we provide Salesmen with a Customer Manual prospects find hard to resist.

Distributorships and Dealerships Available Now!

WRITE OR WIRE

GREAT NATIONAL
AIR CONDITIONING CORPORATION

1305-7 So. Lamar St. Dallas, Texas

-yours for the asking

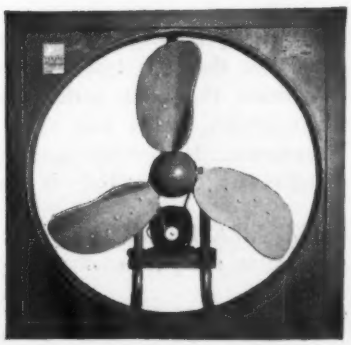
This attractive VIKING FAN manual serves three purposes: It explains in detail the principles of home cooling by attic ventilation; it gives complete information and installation instructions for the Viking CirCOOLator attic fan; it is an impressive sales-presentation manual for the dealer. It is a GUIDE TO GREATER PROFITS.

•

Whether you sell Viking Fans, some other make – or even none at all, you will find this manual indispensable as a source of ready, authentic information on summer home cooling. Write for your copy today.

•

In keeping with its policy of offering its dealers "extra plus" values in merchandise and sales helps, Viking presents its 1939 Attic Fan dealer manual. Here, in one attractive book, is the complete story of summer home cooling with Attic Ventilation – colorfully illustrated with charts and photographs, complete estimating and installation instructions, and a complete sales story to help dealers close their prospects. **Viking has scored again.** Be sure to order your copy while the limited quantity lasts.



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Ask for Bulletin No. A112S

VIKING AIR CONDITIONING CORPORATION
Main & Center Streets • Cleveland, Ohio

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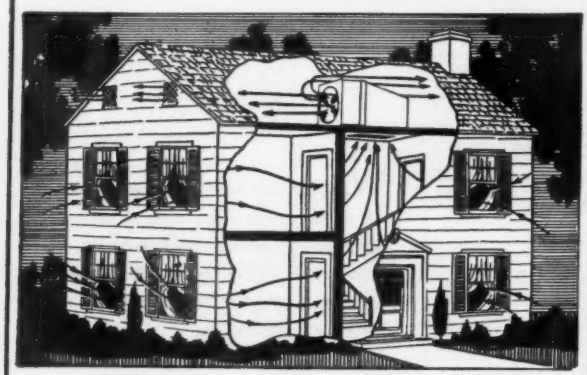
ACT NOW!

TO CASH IN ON BIG SUMMER PROFITS WITH

REX AIRATE



ATTIC VENTILATION

The rapidly growing interest in attic ventilation indicates that this type of home cooling will duplicate the sales performance of electric refrigerators, radios and other modern home appliances. Now—while opportunity for volume profits are the greatest—is the time to act!

REX AIRATE attic ventilators are furnished complete, ready to install, with automatic ceiling shutters.

Write today for new sales promotional plans

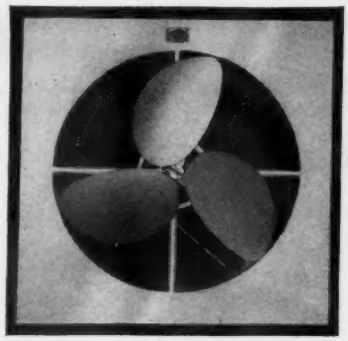
AIR CONTROLS, INC.,
Div. of The Cleveland Heater Co.,
1933 West 114th, Cleveland, Ohio.

Name .....

Address .....

City ..... State .....

E. S. 3-39



NEW 1939 COOLVENT ATTIC FANS

Built for Slow Speed, Quiet Operation!

A new, redesigned attic fan that will operate more quietly and provide trouble free service for years. New, highly efficient three blade fan handles more air at slow speeds. Exclusive, twin, rubber mounted ball bearing pillow block and resilient base type semi-enclosed motors give quiet operation and eliminate service calls. Construction plans, various methods of installation and suction chamber details are also provided. With COOLVENT it is easy to sell scientifically engineered attic fan ventilation.

CERTIFIED RATINGS

For your protection, COOLVENT ATTIC FANS are tested and rated in accordance with standard test code as adopted jointly by Nat'l. Ass'n of Fan Mfgrs., and American Society of Heating & Ventilating Engineers. Write for new bulletin and prices.

Insist on CERTIFIED RATINGS Install AUTOVENT Ventilation

AUTOVENT FAN & BLOWER CO.

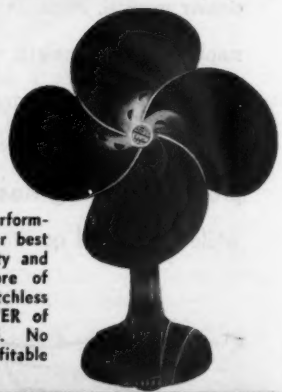
1825-27 N. KOSTNER AVE., CHICAGO, ILL.

DON'T CUT YOUR FAN SALES IN HALF!

Samson Safe-flex gives your customers two major features *they want* . . . and *can't get* in ordinary, outmoded metal-bladed fans. The safety of flexible rubber blades. New silence in operation.

Again this year Safe-flex out-values the field.

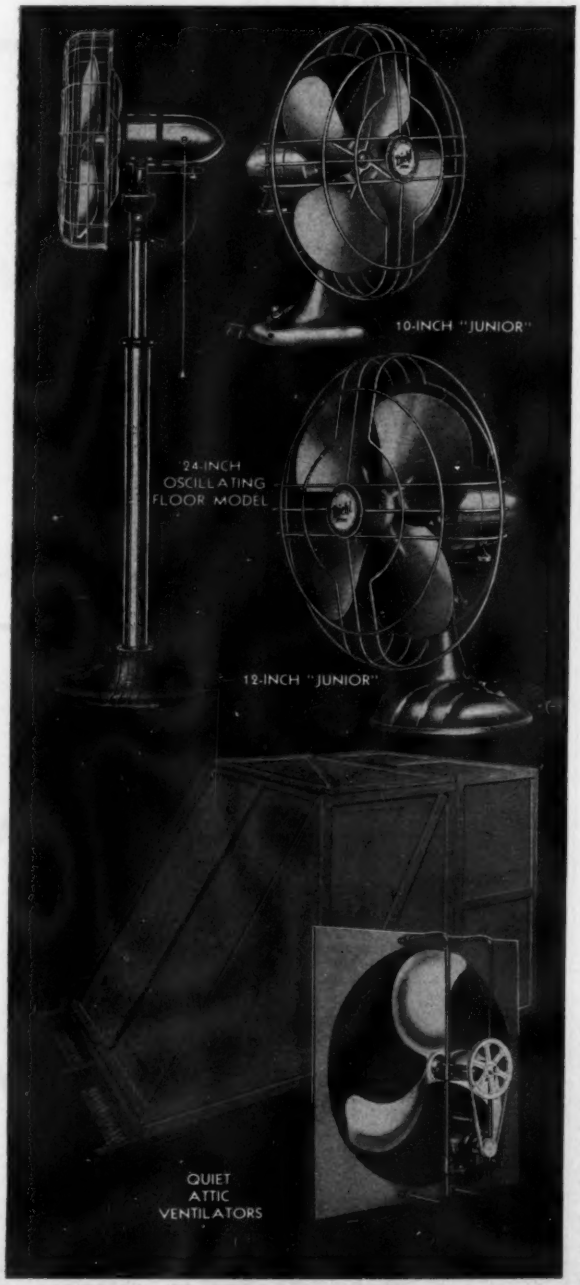
SMART NEW BRIGHT CHROME NOSEPIECE is only one of the sensational improvements in design and performance that makes Samson Safe-flex your best bet for 1939 profits. With new beauty and performance available, more and more of your customers will insist on the matchless SAFETY, SILENCE and BREEZE-POWER of SAFE-FLEX RUBBER-BLADED FANS. No wide-awake dealer will pass up this profitable business.



SAMSON Safe-flex the original RUBBER BLADED ELECTRIC FAN

Copyright 1939, SAMSON-UNITED CORPORATION, ROCHESTER, N. Y.

OUTSTANDING LEADERS IN THE OUTSTANDING LINE OF . . . DIEHL FANS



Leaders of leaders—here are top-flight sales makers for alert dealers who have realized that Diehl Fans for 1939 set a high-level mark . . . . even for Diehl.

"JUNIOR" 10" and 12" OSCILLATING

The new models for 1939 offer exceptional value and beauty. Notice the appeal of their streamlined design and wide-wing blades. Their modern green finish blends with office and home furnishings. Just start them and let your customer note the smooth, quiet operation and the large volume of air moved. They are fully guaranteed and every sales appeal is there—ready to work for you—including a very moderate price.

24" OSCILLATING AIR CIRCULATORS, FLOOR MODEL

24" Oscillating Air Circulators successfuly combine the air volume of an air circulator with the air distribution of a regular oscillating fan—a demonstration usually means a sale—write for bulletin #1953.

QUIET ATTIC VENTILATORS

Four sizes are available—material for suction chamber combines with packing case to reduce cost of installation—really remarkable units and priced right! Described in bulletin #1957.

THE DIEHL FIFTIETH ANNUAL FAN CATALOG

describes the complete line—Quiet and Standard Oscillating, Ribbonaire, Junior models, Air Circulators, Ceiling, Kitchen and Ventilating Fans. General and specialized sales helps are available—booklets, window and wall displays, everything to enable the dealer to benefit by advertising and selling the complete Diehl Line. Ask your wholesaler for full information and prices or write direct.

DIEHL MANUFACTURING CO. • Elizabethport, N. J.
Electrical Division of THE SINGER MANUFACTURING COMPANY
ATLANTA • BOSTON • CHICAGO • DALLAS • NEW YORK • PHILADELPHIA

IT'S HOT!

THE VICTOR *Mono-matic*

WORLD'S EASIEST-TO-USE *and Easiest-To-Sell* Portable Electric Ironer!

NO OTHER PORTABLE IRONER OFFERS THESE IMPORTANT FEATURES

20-INCH ROLL

KNEE CONTROL

SELECTIVE "LAG"

SINGLE LEVER ACTION

ONLY $34.95

IRONS EVERYTHING—Presses, Too!

"World's *Easiest-to-Use* Electric Ironer" is no idle claim—the Victor Mono-matic is exactly that! Its Single Lever action is the simplest, most natural control ever built on an ironer . . . It can be converted *instantly* to Knee Control if desired . . . Its big 20-inch Roll irons large pieces practically as fast as expensive cabinet ironers . . . And with the new Selective "Lag," any woman can produce "professional" work the very first time! In short, the portable Victor Mono-matic *looks* like an ironer and *irons like one!*

A BIG NEW MARKET!

"World's *Easiest-to-Sell* Electric Ironer"—the Mono-matic is a real door-opener! The right size to be taken directly to a prospective buyer's door . . . light enough for a woman to carry to a card table anywhere in the house . . . priced low enough to appeal strongly to every woman—and her husband—who has thought an electric ironer was beyond her budget . . . the Victor Mono-matic is designed for the "hottest" market in the home appliance field today!

WRITE FOR DETAILS TODAY!

With four big features exclusively Victor's—with an aggressive national advertising campaign to 18,000,000 readers of that phenomenally *live* magazine, LIFE, starting in March—with many other sales-compelling dealer helps available—and with Victor's liberal plan that makes *your* profit bigger—you can't afford to miss this big profit-boosting opportunity. Write for complete information—today!

VICTOR ELECTRIC PRODUCTS, Inc.

2954 Robertson Avenue, Cincinnati, Ohio

Boost Your Summer Profits with

VICTOR *"Miracle Breeze" Fans*

As Modern as TOMORROW

This streamlined beauty is the new Deluxe 16-inch SIGNAL 3-speed Fan. It is modern in styling and engineering. Some of the outstanding features are enclosed oscillating unit with push button control, slow speed motor, greater air delivery, wide sweeping fan blades and unusual quietness.

$29.50 LIST

Finished in rich black baked-on enamel, polished aluminum blades and cadmium plated guard.

SIGNAL ELECTRIC MFG. CO.
MENOMINEE, MICH.

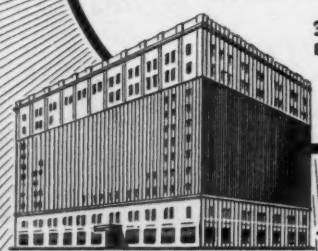
SIGNAL

Offices in all principal cities

● RESIDENTIAL SURROUNDINGS
● COMMERCIAL LOCATION

HOTEL FORT WAYNE

In addition to the superior accommodations at the Fort Wayne, guests enjoy a superb location in a residential community, yet convenient to the business districts. Hotel Fort Wayne provides economy without sacrifice of comfort or location.



300 ROOMS EACH WITH BATH FROM $2

TEMPLE AT CASS

OPPOSITE MASONIC TEMPLE

DETROIT

Wire-Nuts

IDEAL SOLDERLESS TAPELESS WIRE CONNECTORS

Millions Now in Use!

HERE'S HOW!

Better Electrically

Stronger Mechanically

1 SKIN WIRES
2 SCREW ON
THAT'S ALL!

No Twisting of Wires Necessary! Wires are automatically twisted and threaded together as "Wire-Nut" is applied.

Samples on Request

Fully Approved Listed by Underwriters' Laboratories, Incorporated

ELECTRICAL PRODUCTS DIVISION
IDEAL COMMUTATOR DRESSER COMPANY
1017 Park Avenue Sycamore, Illinois

YOUR KEY TO COMFORT

IN St Louis

HOTEL Kennox

9th and WASHINGTON

80% OF ALL ROOMS $3.50 OR LESS, SINGLE $5.00 OR LESS, DOUBLE

THEY GO FOR YOU!

A product of the General Electric Company for more than 45 years, General Electric Fans are known the world over for their high-quality construction, efficient operation, and long life.

And because General Electric Fans are dependable, we back them up with what we believe to be the most liberal service policy in the fan industry—a service policy that provides immediate and free replacement of any G-E Fan found defective in material or workmanship during the warranty period.

Carry General Electric Fans this year and enjoy the profit opportunity extended you by the best known and most complete line of high-quality fans in the industry. You go for them—and they'll go for you!

Have you seen the unique G-E Fan Portfolio, "LET'S GET DOWN TO BRASS TACKS"? The salesman of your nearest General Electric Fan Distributor has a copy. Ask to see it when he next calls. You'll find it chock-full of sound advice!

APPLIANCE AND MERCHANDISE DEPARTMENT
GENERAL ELECTRIC CO., BRIDGEPORT, CONN.

GENERAL ELECTRIC

Wiring Programs in Southern Cities . .

(*Continued from page* 7)

fore they are occupied. The overall effect of all this activity is to make the new home owner as conscious and as proud of the wiring system as he is of any of the more highly publicized construction features.

In the new home construction field, too, the electrical inspector is finding that due to the effects of this program on the public there is a greater appreciation of the service the inspector renders and an increasing interest in his suggestions as to the advisability of full adequacy in the original installation.

In the South those contractors who have continued to fight—in the face of what too many of their fellow contractors had given up as a lost cause—the fight for adequate wiring—saw the program as the first real help the industry had given them to carry on. They felt that it would do for the wiring job and the contractors' business what other national industry promotions were doing for electric refrigeration, electric cooking, lighting and what not.

Many utilities in this territory have organized extensive wiring promotions and reports are frequently being received of added man-power being put into these operations. Just as a few cases in point there are the cross-section model home display used effectively by the Mississippi Power & Light Company in connection with cooking classes held in 19 communities they serve; the amplified residential wiring program recently announced for this year by the Arkansas Power & Light Company; programs of both the Dallas Power & Light Company and the Texas Power & Light Company, the latter employing a trailer equipped with the sound slide film and promotional material to educate industry representatives in the many communities it serves; the activity of the Duke Power Company and the Florida and Birmingham programs already mentioned.

All this activity shows that the industry believes sincerely and without reservation that adequate wiring is *basic*. It also proves that the industry has marked adequate wiring as one of its *must* promotional activities. Throughout the South the men and women of the electrical industry are taking up this national program as the "message to Garcia" and are carrying it on—with enthusiasm, energy, ingenuity and with ever-increasing satisfaction.

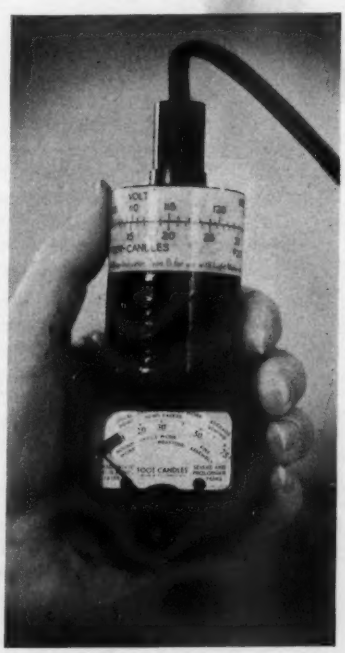
Ideal Approach for Industrial Rewiring

(*Continued from page* 16)

the cost of lighting delivered rises sharply with the voltage drop since the corresponding drop in wattage is relatively small.

A careful survey will show that in many plants where high wattage lamps are used, the operator is being robbed of light which is paid for but not received because of poor wiring, and this may be particularly true where new lighting fixtures with high wattage lamps have been installed on existing circuits.

The prevalence of poor wiring is appalling. But this merely signifies the enormous market waiting for the contractor who will gather data and information on voltage drop, light losses, excessive cost of light and similar material for use as sales ammunition to create wiring jobs. With the light meter and voltage indicating device and willingness to wear out shoe leather to contact prospects, the contractor has all that is needed to cash in on the interest and desire created by the Better Light-Better Sight program over the past few years.



The tricky little device shown here converts an ordinary photo-electric light meter into an inexpensive voltmeter. The combination instrument will enable the contractor to make industrial plant surveys for both lighting and voltage.

Relighting Program in Alabama Mill Completed

SEEING conditions are vastly improved in the textile plant of the Linen Thread Company, Anniston, Ala., following a re-lighting program recently undertaken. The modernization of the lighting system was spread out over three years, so that the expense could be budgeted and would not represent such a large capital expenditure at one time. One section was re-lighted in 1937, the second section in 1938 and the third and last unit of the plant will be modernized in 1939.

In the section just completed the illumination was stepped up from an inadequate 3½ to 7 foot-candles to aproximately 30 foot-candles, which is believed to make it one of the best lighted textile plants in the United States. Employees may now keep check on the most delicate machine operations without eye-strain. Color selection is greatly improved and the net result is less seconds and other merchandise of inferior grade.

All open wiring was torn out in the modernization and concealed wiring of the latest type installed. Old type fixtures of the type prevalent 15 to 20 years ago, and consisting of nearly five hundred 100-watt shallow dome reflectors, were replaced with 849 18-inch reflectors which are in line with the recommendations of illuminating engineers. Inside frosted lamps, each of 300 watts capacity were used. Individual control for each bay or working area of the plant is provided.

Comments from a number of the 600 employees in the plant indicate that they were most appreciative of the new lighting system. "We couldn't get along now without it," was generally heard.

A. E. Massey, manager of the plant, had the assistance of G. L. Morris, lighting engineer, of the Alabama Power Company, in working out the lighting arrangement.

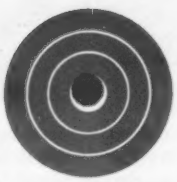
CHROMALOX

again demonstrates

RANGE UNIT LEADERSHIP!

The RIGHT HEAT . . . for every cooking operation

The RIGHT SIZE . . . for every cooking utensil



HIGH — *all three rings energized. (Note red color is used to illustrate operation — but Chromalox units do not glow red in service. They are designed to transmit heat by conduction — contact).*

MEDIUM — *two rings only energized, giving approximately ¾ of High heat distributed as illustrated.*

CENTER — *middle ring only energized, permitting the use of small utensils with maximum efficiency and economy — the exclusive Chromalox "two-units-in-one" feature.*

LOW — *reduced wattage over two rings only, giving approximately 1/6 of High heat.*

SIMMER — *all three rings at low intensity, giving 1/16 of High heat.*

Outstanding and exclusive advantages — attributes which have made Chromalox units preferred equipment among range builders, utilities, electrical dealers, and the vast army of range users — are more pronounced than ever in the new Chromalox Super-Speed, *3-ring,* 2000-watt unit. Designed for 5-heat operation, it surpasses even traditional Chromalox performance by giving uniform heat distribution over the bottom surface of the cooking utensil in *four* switch positions, with a medium heat approximately ¾ of High heat.

Chromalox units for 5-heat operation — four sizes in the two-ring type and this new three-ring type — give you a powerful addition to the many other Chromalox sales-building factors. Study the drawings on the left, showing the three-ring unit. Note how these five heats are attained, also how provision is made for Chromalox "two-units-in-one" economy in the use of small utensils — the big saving feature which only Chromalox can offer.

Here, then, is the range unit of today — the same fast-cooking, flat-topped, easily cleaned Chromalox unit which has made electric range history, with added flexibility, increased speed, greater potential savings . . . and intensified appeal to every range user.

The series of Chromalox Super-Speed units for use with 5-heat switches consists of four standard sizes in the two-ring construction — 1000 watts, 1200 watts, 1500 watts and 2000 watts — and the new 3-ring, 2000-watt unit illustrated.

EDWIN L. WIEGAND CO. • 7600 Thomas Blvd., Pittsburgh, P

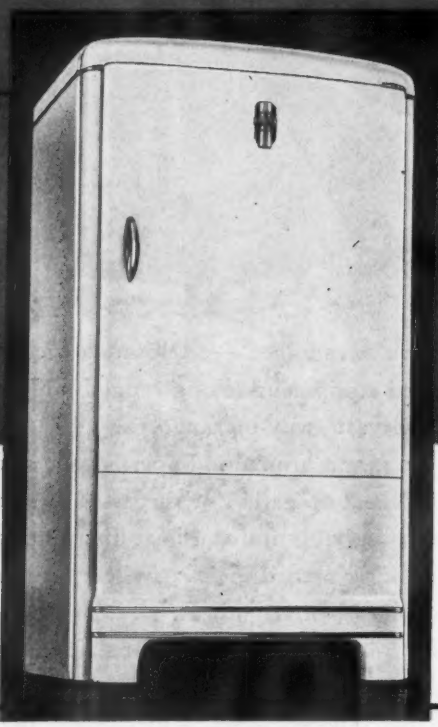
Write us or our nearest representative

ATLANTA, Ga.—C. B. Rogers, 1000 Peachtree Street
OKLAHOMA CITY, Okla.—Paul Berry, 3128 N. W. 26th Street
DALLAS, Texas—Elgin B. Robertson, 1215 N. Zangs Blvd.
RALEIGH, N. C.—W. R. Phillips

Frigidaire and General Motors Present The World's First "Cold-Wall" Refrigerator

1939 FRIGIDAIRE WITH THE METER-MISER

BUILT ON AN ENTIRELY NEW PRINCIPLE!



Reproduced from certified, unretouched photographs of identical foods, refrigerated, uncovered, at comparable temperatures.

Sensational New-Type Refrigerator opens up new era in better food-keeping . . . saves food's vital juices from drying out . . . preserves food vitality for days longer . . . now being shown to the public!

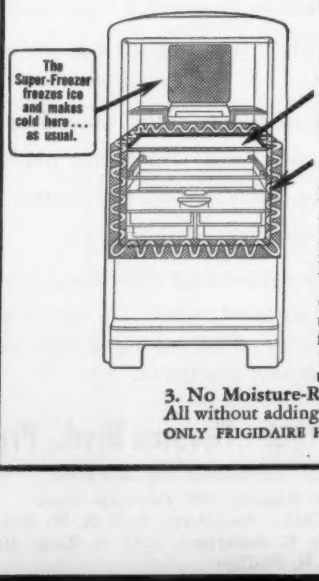
● Years in the making . . . now years ahead! . . . Frigidaire and General Motors have scored another triumph of engineering . . . in presenting for the first time this amazing new "Cold-Wall" Frigidaire.

It's now being shown to the public. Truly, it's a modern food-keeping miracle. For now it is possible to store even highly perishable foods . . . prolong their original freshness . . . retain their rich nutritional values . . . save their peak fresh flavor . . . days longer than ever before.

And the proof of this great food-keeping improvement is so dramatic that millions will marvel at it!

New in simple beauty, new in basic design, new in appointments of greater usefulness . . . new from top to bottom, this 1939 Frigidaire offers dealers new sales and profit opportunities. Coordinated with this sensational new product are new high-speed selling helps—plus an advertising and sales promotion program as powerful as the appeal of the products themselves. Sweepingly advanced products, streamlined sales promotion and advertising, swift, direct sales strategy . . . everything in the program . . . points to greater sales rewards for Frigidaire Dealers in 1939!

HOW AMAZING "COLD-WALL" PRINCIPLE WORKS



NOW, FOR THE FIRST TIME

1. THE NEW "DEW-FRESH SEAL"—A SOLID GLASS PARTITION—DIVIDES THE CABINET INTO 2 COMPARTMENTS

and

2. THE LOWER COMPARTMENT IS REFRIGERATED DIRECTLY *THROUGH THE WALLS* BY CONCEALED REFRIGERATING COILS.

● This provides all 3 essentials for keeping foods vitally fresh *longer than ever before*—1. Uniform Low Temperatures. 2. High Humidity. 3. No Moisture-Robbing Air Circulation. All without adding a single moving part! AND ONLY FRIGIDAIRE HAS IT!

Only Frigidaire Has The Meter-Miser!

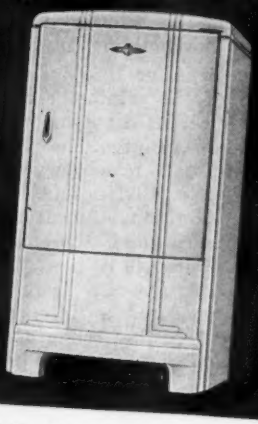
Simplest Refrigerating Mechanism Ever Built . . . and when parts aren't there, they just can't use current or wear. Unseen, trouble-free, completely sealed in a permanent bath of oil. 5-Year Protection Plan backed by General Motors.

Only Frigidaire Has Quickube Trays!

Imitated but never equalled . . . Easier to remove—Easier to use—lift one lever and cubes are free, two or a trayful. *Built Sturdier. Faster Freezing. Better Looking.* Compare—and you'll want to sell only GENUINE FRIGIDAIRE QUICKUBE TRAYS.

More Big News For 1939

Frigidaire Announces A NEW LOW PRICE For a Brand-New 1939 . . . Full 6 Cubic Foot GENUINE FRIGIDAIRE WITH THE METER-MISER "Super-Value 6"



SAME Simplest Refrigerating Mechanism Ever Built!

SAME World-Famous Meter-Miser

SAME One-Piece All-Steel Cabinet Construction

SAME finest features of quality and performance . . . as other Frigidaire models costing up to $100 more!

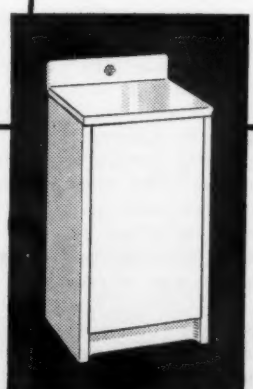
Here is a traffic-builder! A 6 cu. ft. low-price quality refrigerator that will bring *more* interested prospects to dealers' stores. It rounds out the Frigidaire line of refrigerators to give dealers a complete range of models and prices in every competitive field.

Look at this Line-Up of New Frigidaire Models!

6 Cu. Ft. "Super-Value 6"	Dulux Finish
3 Cu. Ft. Model DA	"
4 Cu. Ft. Model DA	"
5 Cu. Ft. "Special"	"
6 Cu. Ft. "Special"	"
4 Cu. Ft. "Master"	"
5 Cu. Ft. "Master"	"
6 Cu. Ft. "Master"	"
8 Cu. Ft. "Master"	"
6 Cu. Ft. "Cold-Wall"	"
8 Cu. Ft. "Cold-Wall"	"
5 Cu. Ft. "Cold-Wall"	"
6 Cu. Ft. "Cold-Wall"	Porcelain
8 Cu. Ft. "Cold-Wall"	"
12.5 Cu. Ft. Imperial (2-Door) "Cold-Wall"	"

Every one with the exclusive Meter-Miser

A Size for Every Need and Purpose . . . Price for Every Budget



For 1939 the FRIGIDAIRE Electric Range COMBINES Low Cost . . . High Speed . . . Sure Results

The Frigidaire Electric Range combines all these "Custom-Built" Features . . . For Low Cost . . . High Speed . . . Sure Results

Every Unit a "Speed-Heat" Unit with 5 Cooking Speeds
Full-Size, Economical "Even-Heat" Oven
Double-Duty "Thermizer"
1-Piece All-Porcelain Cabinet
1-Piece Stainless Porcelain Top
High-Speed Broiler
Exclusive "Evenizer" Heat Distributor
1-Piece All-Porcelain Oven Interior
Non-Tilt Sliding Shelves
Counter-Balanced, Shelf-Type Oven Door
Front Opening Oven Vent
Hydraulic Oven Heat Control
Silver Contact Switches
Armored Wiring
Utensil Storage Drawers

Above Features in every Household Model—Following Features either standard or optional equipment—depending on model selected.

"Thrifto-Matic" Switch
"Cook-Master" Control
"Time Signal"
Warming Drawer
Cooking Top Lamp
Condiment Set

These Beautiful Porcelain Ranges give a wide choice of prices and models.

● In a single year, this marvelous electric range has become one of America's favorites. Designed by 7,550 women . . . practical homemakers who had seen and used all kinds of ranges, the Frigidaire Electric Range combines all the advantages of modern electric cooking to give Low Cost . . . High Speed . . . Sure Results.

No wonder there is so much enthusiasm over the Frigidaire Electric Range. It has proved itself in the field . . . with the dealer, with the salesman, with the consumer. And in 1939, with its new refinements, its additional advancements, with a bold and aggressive sales program it will continue to make records. A comprehensive advertising program in national magazines and newspapers will supplement sales activity. Plans are laid for a big year for 1939. It is not too late to get your share of the fastest growing profit line in the industry!

New for 1939

Frigidaire "Table-Top" Electric Water Heater

● Newly designed for the vast market that is rebuilding, remodeling and planning new kitchens. It's usable as another working top in the kitchen, in addition to its superb performance as a maker of plenty of steaming hot water. Handsome, gleaming Dulux finish, compactly built to standard height so that it will fit well into any kitchen design. Economical, efficient, durable. Typical Frigidaire and General Motors dependability and long life.

Frigidaire Electric Water Heaters are also available in beautiful upright cabinet models for kitchen or basement installations. Capacities from 30 gals. to 80 gals.

How Local Groups are Promoting Adequate Wiring

***THE PRINCIPAL** features of local adequate wiring promotional programs in a number of the important trading centers of the South are described in the following pages.*

Some of these programs have been unusually successful; others have made but little progress. Taken as whole, however, this review provides a cross section of what is being done throughout the South to promote adequate wiring.

Alexandria . . plans code revision as first step toward wiring adequacy

A STRENUOUS effort will be made during 1939 by the Electric League of Northern Virginia to enlist the cooperation of building contractors and architects in supporting the National Adequate Wiring Campaign, and to get a foot-hold in Alexandria building upon which to base an advertising campaign backing the adequate wiring movement.

According to E. T. Moore, of the Virginia Public Service Company, a decided up-turn in speculative home building in northern Virginia has created a highly competitive condition between building contractors which, as a logical consequence, has precluded the incorporation of adequate wiring standards in the speculative new home construction.

"Under these cut-throat competitive conditions, the builders have been forced to cut construction costs in every way possible," said Mr. Moore, "and apparently electrical wiring is one of the first places they start cutting. The number of outlets has been pared, the size and adequacy of wire and conduits have been disregarded in many cases, and in any building movement where price is a vitally important factor, quality is bound to suffer."

The Electric League decided to support the National Adequate Wiring movement in September, 1938, when Mr. Tait of the N.A.W. Bureau appeared before a meeting of its members, and outlined the aims and potentials of the campaign.

The first step in planning an advertising campaign to sell adequate wiring to the public in 1939, according to Mr. Moore, is to secure a reference installation, and to feature it in newspaper advertising. To date no homes or buildings in Alexandria have been certified under the Bureau's requirements, but it is understood that a home in one of the exclusive residential sections of Alexandria will be wired according to adequate wiring specifications. The League hopes to use this installation as a reference point, and a feature in advertising, as well as a talking point to the building trades.

Other plans for 1939 include the revision of the minimum requirements for certified wiring in Alexandria and Arlington, one phase of which will make mandatory a service of two No. 4 wires and one No. 8 wire. Additional literature will be purchased and disseminated, and a schedule will be placed in the local newspaper. The League has already sponsored a full-page advertisement in the Arlington-Alexandria telephone directory, bearing the adequate wiring emblem, and listing all the league members.

Beaumont . . intensive campaign centers around state fair exhibit

THE phrase "adequate wiring" is being added rapidly to the vocabularies of residents of Beaumont, Texas, through the aggressive backing of the National Adequate Wiring Campaign by Beaumont's electrical contractors and the local utility officials.

H. A. Thompson, leading Beaumont contractor, took the lead from the start in organizing the contractors' support and following through on the various means of selling the public on better wiring. Mr. Thompson assisted the Gulf States Utility Company officials in arranging a meeting of the local electrical contractors when the campaign was first launched.

Many architects and builders from the Sabine area, comprising both Beaumont and Port Arthur, attended the meeting and heard A. E. Schanuel of the National Adequate Wiring Bureau outline the campaign.

Throughout the summer, both newspaper and direct mail advertising carried on the job of consumer education, the advertisements of the utility company all carrying some copy on the campaign. A great deal of the direct-mail material supplied by the National Bureau was sent out to all electrical consumers by the allied contractors. Another cooperation offered by the utility was in the printing of a reminder to the consumer on the back of all monthly electric bills sent out by the company.

The climax of the 1938 promotion in Beaumont came with the South Texas State Fair in November. Realizing that without a graphic demonstration, many con-

sumers would be conscious of the campaign advertising without actually applying such matters to their own equipment, the contractors engaged a prominent booth at the fair well in advance, and built the summer's campaign up to the display. The Gulf States company cooperated in constructing the booth, which featured the adequate wiring trademark, and centered around a display of various pieces of wiring equipment. One wall carried a placard listing various common defects of residential wiring; the other, a diagram of an ideal layout for electrical wiring of a home.

Mr. Thompson organized the contractors into shifts, placing them on rotating duty at the fair, so that there were always from one to three men on the job at all times. Here they distributed literature supplied by the Bureau, explained the aims of the campaign to visitors, stressed the safety angle, and explained the difference in various types of installation in terms which the laymen could understand.

The force of the summer's advertising was also felt at the fair, many persons coming to the wiring booth from interest stimulated by the campaign's ads. Numerous among the visitors were prospective home builders, and special attention and follow-up was given to those whose plans were already in the making.

"Our whole system of sales has been revamped, to a degree," stated one Beaumont electrician. "Hitherto we've mostly just been called in by the building contractor to handle the wiring job in the cheapest way. No one ever actually consulted us, or asked our advice in planning a building job, as they should, in order to plan the right kind of installation from the start. Through this campaign and the Fair exhibit, we were brought directly into contact with the home owner, and helped him decide how to plan his electrical layout. Needless to say, we got a lot of new business as a result."

Neither group expects startling results for another year or possibly longer. They are both entirely satisfied, however, that an excellent beginning was made in 1938, and that in continuing the campaign with emphasis upon the industrial builder and the home planner, a very sound foundation for future adequate wiring will be laid.

"We don't expect any miracles to result from this movement," said K. E. Sutton, of the utility company. "Folks aren't going to come storming in and demanding the kind of wiring they should really have. But if we keep everlastingly at it, and we plan to do just that, we hope that in time the standards of wiring will catch up to the standards of electrical living. The adequate wiring story is going to stay on the backs of our monthly bills for a long time to come, and we are incorporating the Adequate Wiring trademark in all of our newspaper advertising. We also hope to be able to tell frequently the complete story in newspaper copy.

"Another important angle which we are following is that of employee education. Through employee publications and sales training, we are endeavoring to educate our own organization to the fullest appreciation of the importance of adequate wiring to the customer, and these employees will, in their contacts, become active salespeople for better wiring.

Birmingham . . new division of utility to promote better wiring

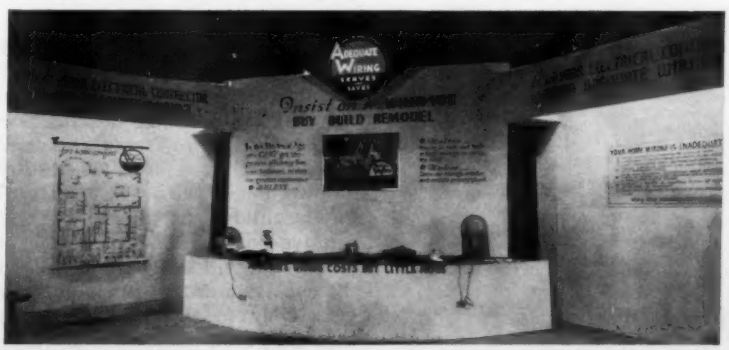
A GOOD start on an adequate quate wiring program was made by the Birmingham Electric Company in 1938 and is being carried on with increased vigor during 1939 as residential building continues at a rapid rate.

Only two homes were completed during the year which were granted certificates as being "Certified Adequately Wired," but they were prominently advertised, and several others which will qualify are now under construction. In addition, numerous home builders were encouraged to improve their wiring layout over old methods and to add modern electrical equipment such as ranges, water heaters, attic fans and indirect lighting.

A new division of the Birmingham Electric Company to promote adequate wiring was set up in direct charge of Munson B. Hinman, and working under Barney DeRamus, residential sales manager, and Holland E. Cox, vice-president in charge of sales. Mr. Hinman will contact architects, contractors and home builders themselves in the interest of improved wiring.

As an illustration of the accomplishments of this division, the architects are now specifying the circuit-breaker type load centers in practically 100 per cent of the homes they design. These provide ideal circuit protection for control of range, water heater, lighting and appliance branch circuits. Standards have also been set as to the number of circuits, size of wiring and number of outlets.

The wiring division is not interested directly in sales, but in a sense runs interference for the merchandise salesmen who follow. Names of prospective home builders are turned over to home service girls who are primarily concerned with the promotion of completely electrified kitchens. Along with their calls goes the offer to



Thousands of Beaumont people became more conscious of the need for adequate wiring after viewing this state fair exhibit

prepare a drawing in colors detailing the kitchen layout. Numerous builders have taken advantage of this service and this has meant better arranged kitchens and more modern appliances.

As a final measure the name of the home builder is turned over to a dealer salesman or to one of the utility's staff of home appliance salesmen who follow up the prospect until the home is equipped.

For this year, some 50 billboards are being erected to promote the certified adequate wiring campaign. Newspaper and other advertising are being utilized and the campaign will be stressed at home shows and expositions held during 1939.

Charleston . . prize contest will introduce adequate wiring to public

PROMOTION of the National Adequate Wiring Campaign in Charleston, W. Va., took a slow beginning in 1938, largely because the guiding spirits in the Charleston Electrical League felt that the scene was not quite set for an active consumer promotion of improved wiring facilities.

An ordinance designed to enforce certain wiring specifications was passed in Charleston in 1925, but has since been found to be inadequate to ensure thoroughly safe and complete wiring installations. This problem has more recently occupied the attention of the Electrical League, with the result that at the League's last meeting, an announcement was made to the effect that the city fathers had passed an electrical code which is entirely consistent with the national specifications sponsored by the National Underwriters. Wiring requirements for new contracts will be outlined by specified regulations in the various zones of the city.

The League is now ready to turn its attention to the modernization of existing wiring installations which, according to R. R. Schoolfield, of Schoolfield-Harvey, chairman of the planning committee of the Electrical League, is strictly a merchandising job, selling the public on, and educating them to, the need for adequate wiring.

The ground had been prepared to some extent by the activities of the local utility, whose advertising through 1938 carried frequent insertions of the Bureau's prepared mats. However, the League officials felt that a means of approach to the subject should be found which would appeal to the public at large, and which would awaken general interest more thoroughly than a straight advertising campaign.

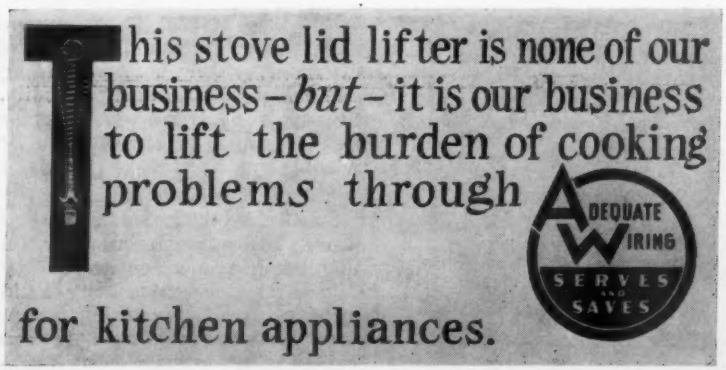
During the first week of February, Grace Reynolds, ELECTRICAL SOUTH reporter, interviewed members of the League's planning committee to learn of the progress and plans of the adequate wiring campaign. After discussing the situation from all angles with Mr. Schoolfield and J. M. Matthews, of Appalachian Electric Power Co., and studying the N.A.W. literature, Miss Reynolds conceived the idea of a city-wide contest to stimulate interest in adequate wiring. The idea was immediately approved by the planning committee.

Enlarging upon the theme proposed by Miss Reynolds, the committee has evolved a contest to be launched early in the spring, entirely original in nature and design, the central motif of which is "It's None of Our Business, but—" Most of the details have been tentatively worked out, and the final campaign will be presented to the League at its next meeting for final approval and adoption. The planning committee feels certain that the plan will appeal to the League members, on its merchandising merits, and will awaken enthusiasm in them to support and cooperate with it.

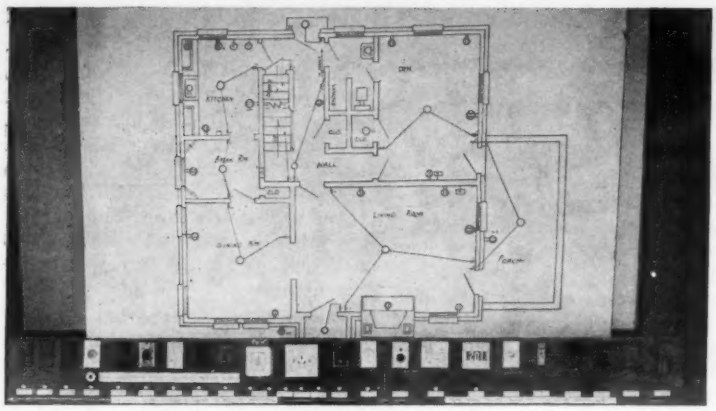
All members of the League with advantageous show windows will devote special space to displays tying in with the adequate wiring campaign, showing related articles of electrical merchandise. Numerous small articles, not related to the electrical field, such as tooth-brushes, hair-pins, liver-pills shoe-laces and all sorts of household miscellanea will be mingled with the electrical merchandise on display. Vacant display space throughout the city will also probably be subsidized for the campaign.

The contest will consist of offering substantial prizes for the contestants who submit the most complete lists of the miscellaneous articles strewn throughout the electrical displays. Contestants will be required to make the lists on special entry blanks which will be obtainable in the stores and offices of members participating. Each entry must be accompanied by a description or opinion of each poster on display, necessitating a complete tour of all displays.

Children in the commercial art departments of the schools will be encouraged to design and produce the posters. Certain designs will be assigned to different groups, placing each in a small contest of its own, and a prize will be offered for the child preparing the most attractive poster. This, believes the committee, will bring the details of the contest and the campaign most effectively to the home owners, through their interest in their children's project. The contest and its terms will also be announced through newspaper advertisements.


This stove lid lifter is none of our business – *but* – it is our business to lift the burden of cooking problems through
ADEQUATE WIRING
SERVES AND SAVES
for kitchen appliances.

One of the posters that will play a prominent part in the public prize contest to introduce adequate wiring in Charleston



Adequate wiring was effectively demonstrated with this push-button operated display board

Charlotte . . shows, canvassing, advertising, used to advantage here

BACKED by a year of remarkable achievement in homes certified and in homes soon to be certified, the Charlotte Adequate Wiring Bureau in North Carolina looks forward to the spring and summer of 1939 to produce seasons of major activity in the nation-wide program for adequately wired homes.

Much of their advertising for the spring campaign of this year is already in type, and some of the members of the board of the Charlotte Adequate Wiring Bureau are going so far as to predict that by May or June the building program in the Piedmont Carolinas will reach such a proportion that there will not be enough competent electricians to do the work!

The first model-wired home to be certified was a home in one of the city's best residential districts, but it was a moderate-priced home costing only $7,500, including the lot. The wiring in this home is adequate in every respect and includes such special features as conveniently placed out-door receptacles, three-way switches wherever necessary, an outlet in the kitchen for the ventilating fan, an electric-clock outlet, lights for closets, radio aerial outlets on both floors, pilot lights for basement and attic, breakfast-room receptacles at table-height, a telephone conduit outlet, extra conduit to both attic and basement for future heavy-duty appliances.

The presentation of this wiring certificate was made by George E. Wilkinson, chairman of the bureau; Norman E. Tindal, secretary; Charles B. Miller, Jr., chairman of the publicity committee; E. V. Sapp, wiring contractor and Walter Nivens, builder of the home.

Analyzing the building situation as it stands now and the prospects for adequate wiring, Mr. Sapp said: "My firm, the Economy Electric & Supply Company, already is at work on 18 jobs, has contracts for 30 more, and during January alone made estimates on 75 others. The way things are going now and the way they appear to me, every contractor in Charlotte will have all the work he can do by May or June and there will not be enough good electricians to do it."

Of course, Mr. Sapp and other bureau leaders do not hold out the hope yet that the majority of the jobs this year will result in adequately wired homes.

"We have laid a good foundation with our program and education," said Mr. Miller. "We have been advertising steadily now since last May and we have had salesmen in the field constantly. We have mailed out many letters to prospects and we have put programs on the radio. We are going to keep on advertising and selling until we get the customers to demanding adequately wired homes; and we will get results comparable with the results similar programs for better lighting have produced in the Carolinas."

"NOW THEY WON'T GET BALLED UP. A-IS FOR THE TABLE LAMP B-IS THE RADIO. C-IS THE REFRIGERATOR..."

Summarizing the activities of the bureau during the year just closed, Mr. Tindal pointed out that the bureau ran 1,359 inches of paid advertising, had several radio broadcasts on adequate wiring, supplied information for many news items and mailed 2,049 letters to prospective home-builders.

Also, the bureau displayed window posters in all electrical shops. Two college electrical engineering students were employed to conduct a house-to-house campaign for improved wiring. They turned in 106 immediate, and 30 future, prospects who were divided by lot among the contractors.

The wiring campaign was tied-in with a lighting display at the Chamber of Commerce where the bureau exhibited a special 8-foot by 9-foot drawing-display of the first adequately wired home in Charlotte. This display was equipped with push-buttons which when pushed illuminated the various fixtures, outlets, receptacles or appliances indicated at the button.

Two thousand people visited the display at the Lighting Show. Afterwards, it was put up for a brief time in the Mint museum and then transferred to the showroom floor of the Duke Power Company's building where other thousands have seen it.

The program in Charlotte is being conducted as a model for the cities in both Carolinas. The Duke Power Company serves a territory of approximately 2,500,000 people in the Carolinas, and already groups in Greensboro, Winston-Salem, Greenville, S. C., and some of the other major cities of the Carolinas have begun to show a keen interest in the progress of the Charlotte campaign.

Chattanooga . . unsettled power situation delays active campaign

ELECTRICAL contractors in Chattanooga look forward to a banner year in residential wiring through an active promotion of the home certification plan under the National Adequate Wiring Campaign. Recently licensed by the National Bureau, the Electric League of Chattanooga plans to use the residential field as a stepping stone to a wide-spread acceptance of adequate wiring standards, and to enter the commercial and industrial field as rapidly as possible.

When the National Adequate Wiring Bureau's campaign was announced early in 1938, the Chattanooga Electric League immediately took steps toward the adoption of the Bureau's standards and campaign, but little headway was possible in 1938 due to the unsettled condition of the city's power supply. The controversy between the Tennessee Electric Power Company and the Tennessee Valley Authority prevented any substantial utility backing of the campaign, since the matter of the ultimate supplier of electricity to the community was undetermined, and the League felt that the cooperation of the utility was a vital factor to the success of the movement.

This problem appears to have been settled on February 4th, with the tentative sale of the Tennessee Electric Power Company to the TVA. The officials of the Chattanooga electric system have indicated that their cooperation in the campaign will be forthcoming as soon as the reorganization of the electric system of the city is completed.

Forseeing an early settlement of the electrical supply question, the Chattanooga Electric League submitted a summary of requirements for certification of approved adequate wiring installations to the National Bureau on January 8, 1939, and the League was licensed by the Bureau's approval of their specifications in January.

Harry Curtis, of the Tennessee Electric Power Company, and former secretary of the League, states that the beginning is to be made in concentration of advertising material and personal contact on the architects and builders of new residences, and on the owners of homes now in need of electrical rehabilitation. Primary effort will be concentrated on the installation of adequate systems in every new home.

A ten-house addition to the Haywood Heights subdivision of Chattanooga which is being promoted by Sam R. Chester will be the first project for Adequate Wiring Certification by the League. As soon as the matter of the number of outlets for each home is decided by Mr. Chester and the electrical contractors, building will go forward in the project, and the fact that the wiring of the homes meets with the approved specifications of both local and national authorities will be used as a selling point by the realtor, and will be extensively advertised. This project is expected to give sufficient impetus to adequate wiring as a home sales feature to encourage all builders to incorporate the League's specifications in their building projects.

Electrical appliance dealers have been recognized by the Chattanooga League as another important factor in the promotion of adequate wiring, particularly in cases of the inadequacy of existing facilities. Electrical appliance sales are mounting steadily in the Chattanooga area, and difficult problems are often presented to appliance dealers who are called upon to deliver and install refrigerators, ranges and radios in homes where, according to reports made to Mr. Curtis, "Many of the houses do not even have enough outlets to let them use more than one or two floor lamps, and the wiring is not nearly large enough to power a major appliance."

Dealers have reported service calls concerning inefficient operation of a refrigerator, in which they have found the refrigerator being run off a double socket in an outlet designed only for a lamp in the first place, with a range being run off the other wire from the socket. In such cases, and in the installation of new appliances, the dealers are being urged to estimate the adequacy of the wiring before delivering the appliance, and to make recommendations for improvements in cases of inadequate outlets and circuits.

One dealer, cooperating heartily with the contractors, has adopted the policy of refusing to deliver and install a major appliance unless the wiring to which it is to be connected is sufficient to carry the load. By endeavoring to gain the same cooperation from all substantial appliance dealers, the League members hope to work with them in improving present inadequate wiring called to their attention by the dealers, and increasing efficiency of appliances sold.

Corpus Christi . . contractors' group organizes adequacy promotion

THAT the successful promotion of the National Adequate Wiring Campaign is a big job and one to be undertaken carefully and thoroughly was realized by electrical contractors in Corpus Christi, Texas, and the action of the local organization has been orderly and systematic, aiming at an ultimate goal of 100% adequate wiring in Corpus Christi.

Wiring standards have, for many years, been extremely low in the Corpus Christi area, according to J. B. Hendricks, chairman of the local organization, and conditions relating to safety and efficiency were, in his words, "deplorable", in many cases.

When A. E. Schanuel, representing the National Adequate Wiring Bureau, met with the local organization early in 1938, the group voted to adopt the campaign. Laying out their program well in advance, the association members considered the work to be done in two phases: first, taking steps to ensure the installation of adequate electrical equipment in all new construction, and second, the rehabilitation of existing inadequate equipment.

The first phase was undertaken when the association appointed a committee to devise a new and adequate electrical ordinance for introduction into the City Council.

You Should be on

SPEAKING TERMS

with every one of these

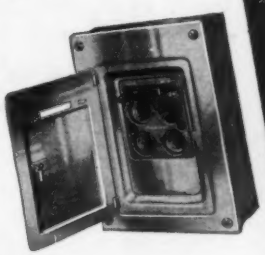
COLT SERVICE Equipment Devices

. . . they mean Cash in the Till to You

No. 35N6-F Flush Type Cabinet with Provision for Transformer and Despard Switches

FUSELESS MAIN SWITCHES . . . with Branch Circuits

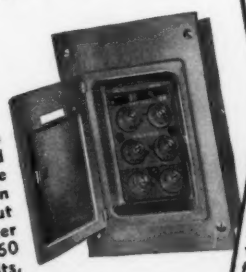
Equipped with as many as six branch circuits, as now permitted by the National Electrical Code. Front operated Rotor Disc type switches, 30 Ampere, 125-250 Volts, with Solid Neutral. Cabinets supplied for Surface or Flush Mounting with or without provision for both bell ringing Transformer and Despard type switches. Plaster adjustments for flush type cabinets. Dome covers permit use of non-tamperable fuses. Interiors are quickly removed from cabinets for wiring . . . the mechanism is designed for long wear and maximum safety.



No. 32N3

FUSIBLE MAIN SWITCHES . . . with Branch Circuits

Front Operated
30 Amp. Rotor Disc Type
Flush or Surface Cabinets



No. 29L4-F

These devices are similar in design to the Fuseless Main Switches described above. They provide in one complete unit, a main switch and both main and branch fuses, with or without provision for bell ringing Transformer and Despard type switches. 30, 60 and 100 amperes, 125-250 Volts, with Solid Neutral. Surface or flush cabinets. Plaster adjustments for flush type cabinets. Interior units are easily removed . . . covers designed for use of non-tamperable fuses. Ruggedly constructed, with simple, safe mechanism.

PULL OUT SERVICE SWITCHES . . .

with Branch Circuits
3 Pole, 125-250 Volts, Solid Neutral

In this complete line of Service Switches, the 60 Ampere cartridge fuses are located in removable fuse holders. The circuit is opened by simply withdrawing the holder from the block. The entire switch mechanism is removable and the block can be reversed to bring lighting circuits at the top. Fuse Holders and Plug Fuse Receptacles are accessible through an auxiliary door in the cover . . . and full clearance is allowed for non-tamperable fuses.

No. 7RL4

COLT *Electrical Products . . .*

Manufactured by a World Famous Organization

COLT'S PATENT FIRE ARMS MFG. CO., Hartford, Conn.

COLT NOARK Electrical Division

Three months' research and preparation were devoted to this bill, which was finally introduced into the Council on September 27, 1938. The pressure placed behind the ordinance by the electrical interests was sufficient that the bill was declared an emergency ordinance by Mayor A. C. Macaughan, and was passed and approved the same day it was introduced.

Substantially the bill provides that all construction shall be under the supervision of a Master Electrician, and shall be constructed under a permit and inspection by the city inspector; establishes standards for safe and adequate wiring in installation, repair and maintenance of all electric wiring and fixtures; and provides an Electrical Examining Board for the examination and licensing of all persons in the local electrical business. The minimum requirements of wiring are equal to the minimum standards of the Adequate Wiring Bureau.

Plans are now being completed for an active campaign directed at the owner of buildings now inadequately wired, in an effort to stimulate rehabilitation business.

Mailing of literature is planned, and a series of displays of electrical equipment, contrasting applications of efficient and inefficient methods and equipment, will be arranged in the windows of the stores of organization members. Newspaper advertising will be used to direct attention to these displays, and to arouse interest in the canvassing work by means of which the electricians plan to personally "sell" adequate wiring.

"FINE THING.... WE'VE A MILLION DOLLAR HOME AND NO OUTLET IN THE BATHROOM!"

Dallas . . two full-time utility employees sell program to builders

THE National Adequate Wiring Program is being promoted aggressively in Dallas, Texas, by an organization consisting of representatives from the electrical wholesalers, the Dallas Power & Light Company, and the Dallas Electrical Contractors Association.

The program was launched in July, 1938. The first phase of the program was devoted almost entirely to educational work which included not only publicity and advertising directed toward the public but also the education of members of the Dallas industry on the subject of adequate wiring.

Later in the year, the second phase of the Dallas group program went into effect—the certification of adequately wired homes. The standards of adequacy used for certification in Dallas are based on the national specifications for residential wiring and a number of homes have been certified.

Whole-hearted cooperation has been given the local program by the Dallas Power & Light Company. In addition to considerable consumer advertising and distribution of promotional material, the company is demonstrating the advantages of adequate wiring to householders dramatically in the "Home Service Cottage" on the second floor of the Dallas Power & Light Company Building. This model home supplies a splendid vehicle for the adequate wiring story and, in addition, wiring exhibits furnished by manufacturers are displayed in the cottage.

In an effort to promote higher standards of wiring, the company has assigned two men with architectural experience to the work of assisting home owners, builders, architects, and others in laying out adequate wiring plans; to check plans for adequacy of wiring; and to give advice on wiring matters in general. In addition, home service advisers supplied by this company will call on builders of new homes and, wherever possible, go over the plans with the architect to see that wiring will be adequate.

Administration details of the Dallas Adequate Wiring Program are handled by an industry committee composed of Stanley Zercher, chairman, Graybar Electric Company; P. M. Rutherford, secretary, Dallas Power & Light Company; eight wholesale representatives: E. T. Summers, G. R. Wimbish, H. R. Worthington, Alex Maletio, Jr., Wynne Snoots, H. F. Rogers, M. F. Sterett, and W. F. Koch; and two contractor representatives: Rob Roy and Jim McClure.

The Texas Power & Light Company which maintains headquarters in Dallas and serves a large area in Texas has successfully employed a trailer, equipped with the adequate wiring sound film and complete promotional material supplies, to educate industry representatives throughout the territory served by the company.

This exhibit demonstrated to Dallas Home Show visitors the actual effect of appliance load on different size circuits in terms of watts lost in wires and voltage drop

AN ALL-STAR LINE-UP

FOR ANY ADEQUATE WIRING PROGRAM

RACO · ALL-STEEL Galvanized Box Material complies with Federal Specification W. O. 821-A.

RACO • ALL-STEEL • PRODUCTS

• The ability of RACO • ALL - STEEL • PRODUCTS to meet present day wiring requirements effectively and economically has won a nation-wide acceptance from architects, engineers, contractors and dealers. These products provide advantages which are equally important for the increasing number of new building jobs *and* the steadily growing rural and urban modernization jobs.

Developed by competent engineers who keep pace with the changes in wiring trends, RACO • ALL - STEEL • Products contain features which increase efficiency and comply with local conditions and requirements. For example: the "JK" box, with external clamp shown above, provides maximum space inside of the box for splices, connections, etc.—equipped with JK—External Clamps, either metallic or non-metallic cables may be used. The illustration above indicates how the knock-out surrounding the bushed holes for metallic cables may be removed for use with non-metallic cables.

The more than 40 years of experience behind the switch boxes, outlet boxes, cutout boxes, cabinets, fuse cabs and conduit fittings carrying the famous RACO and ALL-STEEL trade-marks are your assurance of continued quality and dependability.

Write today for catalog illustrating the complete line—there is no obligation.

DISTRIBUTORS IN ALL IMPORTANT CENTERS

Distributed Nationally by

ALL-STEEL-EQUIP COMPANY, INCORPORATED

626 JOHN STREET ● AURORA, ILLINOIS

Factories: South Bend, Indiana ● Aurora, Illinois

RACO • ALL-STEEL • PRODUCTS

SWITCH BOXES • OUTLET BOXES • CUTOUT BOXES
CABINETS • FUSE CABS • CONDUIT FITTINGS

Houston . . utility, contractors plan active wiring campaign in 1939

MEMBERS of the Master Electrical Constractors Association of Houston, which includes most of the major contractors, and the Houston Lighting & Power Company executives were not asleep through 1938 even though little apparent progress was made in a program for promoting adequate wiring. However, the ground work was layed for a most effective campaign as Houston, one of the South's largest cities, adopted an ordinance of sufficient strength to be of great benefit to the local industry. An older ordinance was found to have certain legal flaws more than a year ago.

"With the passing of the new ordinance, we feel that the industry can now get behind an educational program and teach the building fraternity and the public at large the value of adequate wiring under the certification plan," said J. S. Copeland, Copeland Electric Company. Mr. Copeland is president of the Master Electrical Contractors Association in Houston.

"Here in Texas we have a movement under way for legislation that will protect the industry and the public. We have a proposed bill before the State Legislature that has been favorably reported by the committee and has the support of a number of representatives and senators. This bill will be a statewide licensing law, and it will provide for inspection by authorized inspectors although the state statute will not supersede any city ordinance."

Bearing out the statement of Mr. Copeland, H. E. Dorrill of the Houston Lighting & Power Company reported that the lack of a city ordinance had handicapped their promotional work. But now, with the new ordinance in effect, this public utility is sponsoring a very aggressive drive on adequate wiring.

The entire sales department of the company will aggressively promote adequate wiring this year. Forty home service advisors will call on all residential customers with a view to selling additional usage of old equipment as well as new services. These girls have specific zones to work in and, in the adequate wiring activity being planned for this year, each girl will be held responsible for the new residential construction carried on in her particular district. Two home planning counsellors will work out of the sales promotion division, contacting all architects and speculative builders.

In addition, the utility is planning an aggressive program of advertising, promotion and publicity on adequate wiring. This advertising will be in the form of regular weekly ads in the real estate section of local newspapers; monthly bill inserts to approximately 115,000 residential customers during March; thirty-five billboards, eighteen of which are illuminated and, in addition, the company will feature adequate wiring each month in its three publications, *Appliance Profit News, Electrified Business,* and *Electrified Industry.*

The company has also prepared window display cards on adequate wiring, and these cards will be placed in all electrical supply dealers', appliance dealers' and other windows for the purpose of crating an interest in adequate wiring.

Mr. Dorrill also reports that the local industry is planning to adopt the certification plan because of its advantages, particularly in connection with speculative builders.

Louisville . . building activity impedes progress of local campaign

WHILE the floods which ravaged the Louisville area in 1937 retarded an active commencement of an adequate wiring campaign in the Gateway City, the rehabilitation of damaged property will ultimately offer a foothold for a strong campaign to improve electrical facilities there. 1938 was a record year in the erection of new and replacement dwelling units, and it is expected that 1939 will even surpass last year.

One factor which has kept the National Adquate Wiring Campaign from being felt perceptibly during the past year is the extreme activity of the architects and building contractors, who felt no need for a stimulation of their business. Economy is usually the keynote of a rebuilding market, according to the Louisville building contractors, and consequently no emphasis has been placed by them on better and more expensive wiring.

W. B. Diecks, president of the Louisville chapter of the National Electrical Contractors Association, stated that a double-barrelled campaign would be necessary to make an impression on the Louisville market, directed at both the general public, and at the building trades.

At the inception of the campaign in 1939, the contractors' association and the Kentucky chapter of the I.A.E.I. were in strong accord in supporting it, but were unable to enlist the cooperation of others in the local industry to the extent of doing a successful job of consumer education. Numerous contractors employed, to a certain extent, the literature offered by the National Bureau, but their concerted opinion is that "a strong organized backing is necessary to make the public feel the weight of this campaign."

The plan for 1939, however, according to Mr. Diecks, offers a much better outlook. A strong personal campaign will be directed at the architects and building contractors by the electricians, in an effort to enlist their support in embodying adequate wiring facilities in new home construction plans, and in rehabilitating damaged buildings.

A comprehensive and systematic use of the N.A.W. Bureau's direct mail matter is planned by the contractors' association, to be sent to all electrical consumers in the area, with emphasis on those owning buildings known to have obsolete fixtures or to have been patched hastily after the flood. The electrical inspectors' association has also distributed literature.

The market for wiring in Louisville, continued Mr. Diecks, is tremendous, considering only a very small percent of homes and buildings in the city to be adequately wired.

Memphis . . systematic program assures success of wiring promotion

FIGURES made public on February 5th by Commissioner Picard of the Public Service Department of Memphis are ample evidence that the National Adequate Wiring Campaign has been and is being effectively merchandised to the electricity consumers of Memphis. Electrical installations and repairs in January, stated the report, are off to a lead of 123 permits over the same month in 1938, a total of 526 having been issued by the Department during the past month.

"Scrutinizing these figures closely," said a representative of the Commissioner's department, "we note that January's business is composed of 25% more smaller jobs than were handled last year. This indicates that, while possibly new building construction is getting off to a slightly slower start this year, there is much more interest in the improvement of electrical facilities, and that a great many of these jobs are for replacement and rehabilitation of existing facilities, rather than new building. These facts are ample evidence of the impression that the National Adequate Wiring Campaign has made in Memphis."

The success of the Memphis electrical interests in promoting adequate wiring has been due to the organized and systematic manner in which the Memphis Electric League took hold of the Campaign in 1938, and to the untiring efforts of the League's Activities Committee. Chairman of the committee is W. H. McInnis, of the Memphis Power & Light Company; other members include H. G. Street, L. H. Lanahan, Harry Thomas, W. A. Gentry, R. C. Anderson, William Nutzell, and Ed Gray.

The Memphis Electric League was actively engaged in a local wiring promotion prior to the inception of the N. A. W. campaign, having launched such a program in December, 1936, after the adoption of minimum specifications and a seal and certificate of adequacy. The first such seal was awarded to a Memphis home owner on January 20, 1937.

When the National Adequate Wiring Bureau became active in 1938, its activities were of immediate interest to the aggressive Memphis contractors, and on February 15, 1938, A. C. Tait, of the N. A. W. Bureau, was invited to speak to the League. The League immediately adopted the N. A. W. specifications, and in March, 1938, applied to the National Bureau for a license to operate under the Bureau's specifications. An immediate effect of the N. A. W. on the Memphis operations was a raising of the city's minimum specification standards, as several changes were made in the local specifications before the license was issued in May, 1938.

H. G. Street, one of the leaders of the Memphis electrical industry

Proceeding with its systematic and orderly promotion, the League had meanwhile anticipated the license and authorized a promotional program and budget to promote the activity locally. A committee was appointed by J. A. Fowler, then president of the league, for the purpose of raising a fund of $600 for this work, the League donating one-third of the amount, and the balance to be raised by popular subscription among members and non-members interested in the movement. A total of $627.50 was easily raised.

About $250 of this sum was spent during 1938 for promotional material furnished by the Bureau, including a liberal supply of every item needed in the campaign. Since the beginning of the original promotion in Memphis and continuing through the League's support of the National campaign, a total of $1,401.90 was spent for advertising copy run in the Memphis *Commercial Appeal* alone, as well as miscellaneous expenditures of $237.91 for printing, engraving and supplies.

Further evidence of the acceleration of interest in adequate wiring is found in the fact that under the League's promotion prior to its adoption of the N. A. W. campaign, throughout 1937 and the first six months of 1938, 117 applications for certificates of approval were received and 98 seals and certificates were awarded. Under the N. A. W., 81 applications have been received, or about 70% as many in about one-third the time.

Plans under present League President G. O. Macfarlane call for an active program in 1939. Newspaper schedules will be continued, and the literature used by the league for payroll stuffers, handbills and other means of dissemination will be augmented by 5,000 reprints of the illustrated feature "The Sad, Sad Story of Mrs. Jones" by Kathleen Robertson, which was published in the February, 1939 issue of *McCalls Magazine*.

Miami . . speaking tour in Miami trade area opens intensive campaign

THE National Adequate Wiring Campaign has been prevented from reaching more than average activity in Miami during the past year by a very unusual factor: too much business. The paradox is explained by the unusual building boom which has been in progress in Miami and vicinity for the past ten months, according to several of the city's leading contractors, involving a much accelerated construction of both residences and commercial buildings.

"No campaign is necessary to ensure adequate wiring in new buildings," stated Ellis C. Knox, chief of Miami's electrical inspection division, "for it is a standard requirement set by our division on every house and building constructed in the city. We inspect the electric plan for every building before construction, and then

inspect the completed job. Our minimum requirements are always equal to and sometimes above those set by the Adequate Wiring Bureau."

The logical objective for the campaign in Miami is the market presented by the older residences and buildings constructed before the city's electrical standards were raised and enforced. This is the plan which the Florida Power & Light Company and the Florida Association of Electrical Contractors and Dealers, both of whom are in strong support of the campaign, will follow in 1939. Heads of both groups announce intentions of urging the replacement of obsolete fixtures and outlets in the older structures through increased advertising, educational talks, distribution booklets and literature and direct mail.

Opening gun on the drive was a speaking tour made by representatives of the Florida Power & Light Company to more than twenty-five Florida cities and communities. The tour, which began February 13th, was arranged by A. C. Bergh, lighting specialist, and W. H. Davidson, wiring expert, both representatives of the utility company.

They were accompanied and assisted by O. V. Scott, Miami contractor, who is president of the State contractors' and dealers' association, and F. J. McGinnis, West Palm Beach contractor, and secretary of the association.

Their program included the showing of a sound motion picture titled "Power for Living"; a talk on interior wiring design by Mr. Bergh, and another discussion by Mr. Davidson on the penalties and dangers of inadequate wiring. Mr. McGinnis outlined the activities and objectives of the National Adequate Wiring Campaign, stressing the need for sufficiently heavy wire and enough outlets as both a convenience measure and a safety precaution.

New Orleans . . adequate wiring principal objective of association

ONE of the high-lights of the New Orleans' adequate wiring activity has been the recent adoption of a minimum wiring standard in the specification of the Building and Loan Campaign activity, a project of the Home Development Committee, of the local Association of Commerce. E. M. Avegno, in charge of dealers sales for the New Orleans Public Service, Inc., is chairman of the Home Development Committee and has been instrumental in bringing about the adoption of this standard in cooperation with the Adequate Wiring Committee of the local electrical league.

A good approach along broad lines was made during the last five months of 1938 by the Electrical Association of New Orleans with an appeal to contractors, architects and supply houses and a direct approach to those building homes.

In addition to newspaper advertising and direct mail used in 1938, the New Orleans association prepared an elaborate folder on adequate wiring and distributed this to contractors, architects and others. It is probably one of the most complete of its kind used on any similar campaign.

The 1938 campaign included direct mail to approximately 3,000 prospective home builders which was followed up by a call by a "wiring girl" who explained the matter further. The campaign was aided by newspaper advertising which included a direct message to housewives with suggestions for checking to determine whether the home was adequately lighted and wired for greatest comfort and economy.

"AND THIS HOUSE HAS LOTS OF PLACES TO PLUG IN LAMPS AND THINGS!"

Following up preliminary work started in 1938, the Electrical Association of New Orleans will carry out an intensified adequate wiring campaign in 1939.

"Adequate wiring will be our principal objective in 1939 with other activities being tied in and coordinated with this activity," said Rudolph Viener, recently elected president of the association.

"We will carry on some of the good points of the 1938 campaign in an intensified form and will carry out more aggressive efforts in almost all directions where we believe it will help to interest contractors, building and loan associations financing home construction, architects, supply houses and others allied with building in the installation of adequate circuits, necessary wiring and outlets.

"We will try to show the man who is building his own home that unless adequate wiring is installed his home is obsolete before he moves into it. We have tentatively set a minimum of six circuits for average four to six room residences.

"We are concentrating on new construction as conditions do not appear to be ripe for much work on existing homes at this time. The Association's campaign will include regular advertisements in New Orleans newspapers, over radio, billboards and street-car signs and other means.

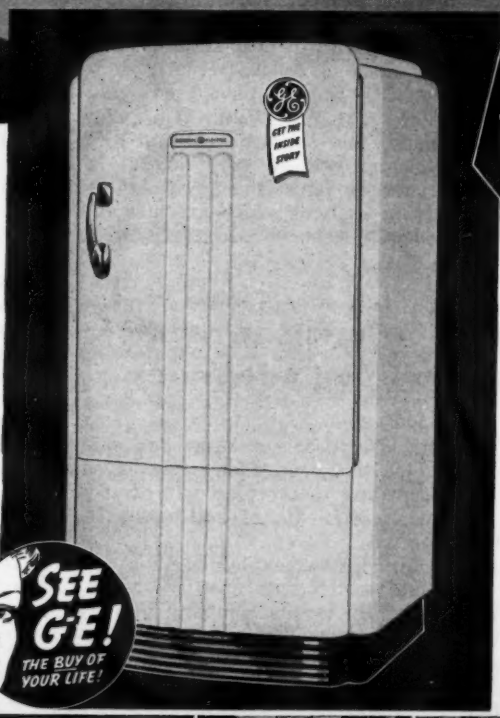
"We will call on architects and distribute folders showing best methods for complete wiring. We will contact all persons that we know of who contemplate building and see that they receive material to acquaint them with the need for adequate wiring in a home."

Final plans for the year's campaign were initiated at a meeting of the executive committee of the Association February 24.

A committee to whip the plans into shape, determine what sums will be spent on advertising and other activities was named. The committee includes W. E. Clement, of New Orleans Public Service, Inc., who headed the activity in 1938, D. L. Craton, George Welman, Leo Hirsch, Paul Muller, J. Otto Kaelin, W. J. Barnes, Walter Barnes, George J. Segal, E. N. Avengo and Mr. Viener, ex-officio.

New Inside and Out!

New styling, new features, new convenience—and a new low price—make the 1939 General Electric the greatest refrigerator "buy" G-E ever offered. "Built for keeps" it has everything needed for thrifty, convenient, safe preservation of food. Nothing experimental about it—both the buyer's food and investment are safe in the G-E!



SELECTIVE AIR CONDITIONS AND NEW LOW PRICES

The new 1939 General Electric gives different *combinations of temperature and humidity* necessary to keep foods at their fullest, finest flavor—and provides the most practical method of food preservation at low cost. No other refrigerator in the world keeps foods looking and tasting better, and retains more of the health-giving vitamins longer, than does the 1939 G-E with SELECTIVE AIR CONDITIONS.

General Electric has built more *sealed* refrigerating mechanisms than any other manufacturer. From the famed G-E "House of Magic" came forced-feed lubrication, oil cooling, acoustic mufflers and "floating power." These advanced features of the G-E Thrift Unit assure quiet operation, low current cost, long life.

See our G-E "House of Magic" at both Fairs

GENERAL ELECTRIC CO., SPECIALTY APPLIANCE DIVISION, NELA PARK, CLEVELAND, OHIO

GENERAL ELECTRIC

Triple-Thrift REFRIGERATORS

GO G-E—ALL THE WAY!

G-E Refrigerators, Ranges, Electric Sink (with Dishwasher and Garbage Disposall), Water Heaters, Washers, Ironers; also "Packaged" Commercial Refrigeration Products.

Norfolk . . first efforts indicate planned program an essential factor

SPORADIC efforts at promotion of the National Adequate Wiring Campaign in Norfolk, by several individual contractors produced one noteworthy result, that of convincing the electrical interests of the city that a definite and organized campaign must be put behind the adequate wiring promotion in order to produce the desired results.

The first definite move toward this organized support of the Campaign was made in December of 1938, when meetings were held under the auspices of the Virginia Electric & Power Company to determine the sentiment of the electrical interests on the program.

The first of these meetings was held early in December in the Virginia Electric & Power Company's auditorium. Contractors, dealers, utility representatives and some architects indicated an inclination to unite in supporting the campaign, and an organization committee was then formed.

The committee, headed by C. A. Leonard, sales manager of the power company, includes A. E. Dunn, sales engineer, also with the utility, L. E. Burford, manager of the Norfolk branch of the Graybar Electric Company, H. I. Tuck, of Tuck & Kendall, and E. G. Middleton, independent contractors.

According to Mr. Dunn, most new residential jobs recently completed in Norfolk have been equal to the N.A.W. standards of adequacy, but he believes that the campaign will be very helpful in promoting replacement business in wiring systems which are now inadequate or have become outdated.

Oklahoma City . . revised code assures new homes wiring adequacy

ALTHOUGH Oklahoma City does not have a local Adequate Wiring Bureau modeled directly after the national plan, it is carrying on with the "Reddy Kilowatt Home" plan for adequate wiring, established here a year or two ago. It has supplemented this with direct mailing and personal contact educational efforts carried on during the past year with architects, contractors, lumber companies and home owners.

This campaign, according to C. E. Hickox, of the sales promotional department of the Oklahoma Gas & Electric Co., has proven very successful. These efforts, in connection with a recently improved city electrical wiring code, have brought about much higher wiring standards for homes built in Oklahoma City and vicinity during the past year, and local leaders of the electric industry have not deemed it necessary to conform strictly to the national campaign.

The "Reddy Kilowatt Home" adequate wiring plan is carried out with building contractors and speculative home builders. It allows each builder a certain sum for advertising a home for sale which has been adequately wired according to the plan and awarded a certificate of adequate wiring.

Mr. Hickox explained that this plan, which was used most successfully by his company in 1937 when a great number of homes were being built in Oklahoma City for sale, is not now being emphasized so strongly since the new wiring code sets wiring standards which conform substantially to the "Reddy Kilowatt Home" specifications.

The plan, however, has not been abandoned and many homes have been wired and certified under it during the past year.

In connection with the wiring of new homes the Oklahoma Gas & Electric Co. is carrying on an intensive campaign of contacting home owners, architects and contractors to secure adequate wiring.

Ben Cardwell, of the Cardwell Electric Co., who is president of the Oklahoma City Electrical Contractor's Association, said that his organization cooperated with the city in amending the city electrical wiring code to make it conform more nearly with the national code. He pointed out that among the improvements were minimum requirements of No. 12 wire and a minimum of one convenience outlet for every 20 feet of usable wall space.

Mr. Cardwell stated that his organization usually does not directly contact home builders on adequate wiring but leaves this activity to the Oklahoma Gas & Electric Co. He pointed out, however, that his organization has arranged to place an exhibit in the Builders' Exhibit Show sponsored by the Construction Industries League of Oklahoma City, Inc.

The exhibit will occupy a space 9 feet by 27 feet under a six months lease. There will be about 50 other exhibits placed by the construction industries organization in its headquarters building at 415 Northwest Seventh Street.

Pine Bluff . . wiring heads list in utility's load building program

ADEQUATE wiring promotion is prominently featured in the comprehensive 1939 sales program of the Arkansas Power & Light Company recently published under the title of "Selective Selling Creates More Profitable Use." The entire load-building program was presented at the company's annual sales meeting held in Pine Bluff.

In continuing and amplifying their wiring activity, the organization plans to contact architects, contractors and builders. The all-service salesmen will solicit orders for electrical contractors and a sales campaign for the installation of additional duplex convenience outlets is being set up.

From the time it started pioneering rural electrification in Arkansas and the South, the Arkansas Power and Light Company has placed adequate wiring first in its program.

Covered neutral cable has been recommended emphatically by the

company. To date more than 2,150 rural homes in the 56 Arkansas counties served by the company have been wired with this type of installation. Not yet has a single case of trouble been reported due to the use of covered neutral cable, according to P. C. Tucker, general sales manager of the utility.

About 50 per cent of the installations, or about 1,000, were made last year. Twenty-five per cent were made in 1937, and the same percentage made in 1936.

"We are thoroughly sold on this type of cable for our simplified adequate wiring program," Mr. Tucker reports. "Our installations have been made in residential, commercial and public buildings in rural sections. We will not attempt to sell the use of this type cable to city contractors until such time as this type of installation is approved by the underwriters."

Several advantages are claimed for concentric cable by Mr. Tucker. "We find that we can sell more outlets per establishment than by using other standard wiring materials," he says, "and we have 25 or 30 contractors who are sold on the use of it because they find quite a saving on the cost of material. Some contractors report they can save 50 per cent on manhours per job."

During the past three years two direct avenues of promotion have been followed in increasing wiring facilities. One is through the contractor, the other through the customer. When a work order is issued by the utility for a rural line, the contractor is notified, as well

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Richmond . . strong organization to back wiring certification plan

THE success of the National Adequate Wiring Campaign in the Virginia capitol was assured at its inception by its whole-hearted adoption by the Electric League of Richmond. The League embraces all significant electrical interests in Richmond, including electrical contractors, jobbers, manufacturers, dealers, and utility.

Embracing the campaign as one of its major objectives, the League outlined a two-fold program which was carried out throughout 1938: education of the public in the benefits of improved wiring, and the creation and discovery of new applications for electrical service.

Much of the material furnished by the National Adequate Wiring Bureau was brought into play, according to W. H. Jenks, president of the Electrical Contractors Institute of Richmond. A running series of newspaper advertisements was sponsored throughout 1938, both by individual members of the League, and by the group. It is estimated that more than 1,000 inches of copy dealing with adequate wiring appeared in the Richmond papers during the past year. Articles dealing with the value of adequate wiring facilities and its significance in community welfare were written, and several columns of editorial material appeared in the local dailies.

All members of the League adopted the N.A.W. seal for an imprint on their letter-heads, statements and other office stationery, and the slogan "Adequate Wiring Saves And Serves" was imprinted where the seal was not practical. At the beginning of the campaign, all leading contractors agreed to make no estimates of wiring jobs which are not based on standards established by the N.A.W. Bureau, and this policy has been followed by all league members.

In October, 1938, a "Modernize Richmond" campaign was launched to promote F.H.A. financing by the various F.H.A. loan agencies in the city, and the electrical interests immediately tied in the wiring campaign with the movement toward modernization. Adequate wiring copy was incorporated in much of the rehabilitation advertising copy, and wiring was stressed as one of the very desirable improvements for which the F.H.A. offers funds. In November the League was authorized to use the Adequate Wiring Bureau Certification Plan, which has been in operation since that time.

"I STILL CAN'T FIND THAT LIGHT SWITCH!"

W. H. Jenks, president, Richmond Electrical Contractors' Institute

A meeting was held in December by the League to summarize progress made during 1938 and to project plans for continued promotion in 1939. The present plan, according to A. H. Herrmann, of the Virginia Electric & Power Company, is to continue along the lines begun in 1938.

"While the results so far have not been so extensive as to show in terms of added load," said Mr. Herrmann, "we feel that this campaign is basic to the progress of the electrical industry, and will produce worthwhile results over a long range program. It is planned to continue the work started in 1938, and concentrate activities this year in an effort to obtain wide-spread acceptance of adequate wiring in residences.

"This campaign will be carried on through newspaper advertising, continued circulation of the *Adequate Wiring Reporter,* a heavy schedule of mailing the N.A.W. direct mail literature to electrical consumers, and an urgent personal campaign by the League members directed at the architects and builders, among whom excellent progress has already been made."

Roanoke . . novel electrical show initiates active campaign for 1939

SEVERAL of the larger electrical contractors in Roanoke became interested in the wiring campaign at its introduction last year, and undertook to interest other firms, and to enlist the cooperation of the Appalachian Electric Power Company. Meetings, steadily growing in attendance, were held through the fall of 1938, to determine a plan of action. C. J. Krebs of the utility company became active in rounding up support for the campaign, and has served as chairman at the meetings. Forty-two contractors have now entered into active support of the campaign, and the Roanoke activity will shortly commence.

The participating contractors have subscribed to funds necessary to purchase a substantial amount of the N.A.W. literature, and dissemination of it will begin early in the Spring.

The Roanoke campaign will be launched with a bang on March first, centering around an Electrical Show which the contractors' group will sponsor at the Roanoke City Auditorium. The show, lasting three days, will feature a model home embodying wiring conforming to N.A.W. standards, and also showing, by way of contrast, a few examples of inadequate wiring which are most frequently found in residential installations, and exposing the dangers and disadvantages of each.

The house was designed by Ben Parrott, and is being built by Smith & Boynton, architects, in sections, outside the auditorium, and will be assembled within the building just before the show. Glass panelling will be placed over all important wiring and connections, normally concealed, to make them visible to visitors.

All participating contractors will have booths at the show, exhibiting various types of electrical merchandise, and incorporating displays calculated to bring home the adequate wiring message in various ways. Lectures on proper methods of residential wiring will be held at intervals throughout the show, literature will be distributed from all booths, and several showings of educational talking pictures will be held. The contractors have agreed that there will be no efforts made at merchandise sales on the floor, the entire meeting to be devoted strictly to education of electricity consumers.

Newspaper copy will be used prior to the opening of the show to stimulate interest in it, and to announce the opening of the drive for improved wiring conditions; periodic advertisements will be carried throughout the year. Large panel posters have been made for attachment to the contractors' delivery trucks, carrying various phrases of the adequate wiring message. The Appalachian Electric Power Company is arranging to place the adequate wiring seal on their consumer statements, and use promotional inserts.

Washington . . rewiring of homes promoted by direct-mail test plan

THE first organization to present a certified wiring award in the national program, the Electric Institute of Washington has gone ahead to include over 100 homes under this certification.

With a new local code in the making and expected to be operating by March 1, with a featured revision raising the minimum residential main entrance switch capacity from 60 to 100 amperes, the organization will point toward an intensified certified wiring program for new homes in 1939.

The most conspicuous single campaign in 1938 was concentrated on the re-wiring of existing homes. A list of 1,000 homes was contacted in a direct mailing test promotion. Half of this list of home owners was obtained from trouble call reports showing existing service inconveniences and wiring hazards. The other half were homes having electric ranges and, of course, at least 60 ampere main entrance equipment. Returns were obtained from more than 10%.

The Institute found the greatest benefit to be derived from publicity tie-ins with featured homes in 1938. One of these was the

(*Continued on page* 64)

EVERY HOME NEEDS
ADEQUATE WIRING
Let us tell you why!
SERVES SAVES
SEE YOUR CONTRACTOR OR SAN ANTONIO PUBLIC SERVICE COMPANY today

LACK of an aggressive local organization has delayed the effective promotion of the National Adequate Wiring Program in San Antonio, Texas, but a splendid start was made during the latter part of the year by the San Antonio Public Service Company in educating its customers to the safety, economy and convenience of adequate wiring.

The company distributed adequate wiring specifications booklets to a large number of architects and builders and also distributed copies of the "Pictorial Primer" to prospective builders of new homes and owners of existing homes.

In its advertising program, the company promoted the subject of adequate wiring through outdoor billboards, and advertising space in practically every daily, weekly and monthly periodical published in the city.

You Can Make Money At Kelvinator's
BIG BIRTHDAY PARTY!

Watch the crowds during Kelvinator's Silver Jubilee Week, April 3rd to April 8th. Many Kelvinator dealers and distributors plan to give away free gifts and special frozen desserts to celebrate the occasion.

CUT YOURSELF IN

on this biggest Refrigerator selling event in 25 years — Kelvinator's Silver Jubilee Celebration!

EXPERIENCED MERCHANDISERS—department store executives—dealers who know what it takes to get store traffic—appreciate the sales value of special events. Experienced merchandisers are saying, "This Jubilee of yours means business for us."

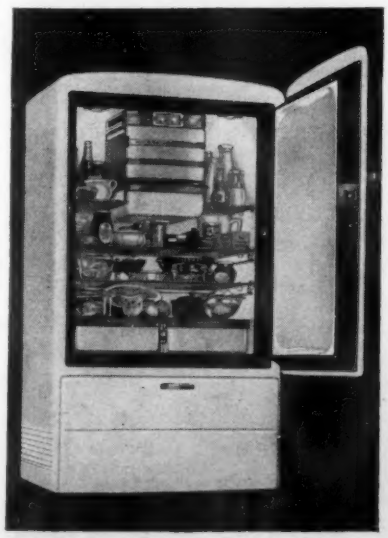
Every Kelvinator dealer and distributor is getting ready to cash in on the big celebration . . . with its six-day Birthday Party . . . brand-new promotional material . . . live-wire local cooperative advertising and free gifts!

This is going to be the "hottest" sales promotion of the year. Behind it is the story of the first successful refrigerator and the latest Kelvinator models . . . the story of improvement after improvement that dates back to the very first electric refrigerator.

Behind it is the new 1939 Kelvinator line, with more new features to talk about . . . *more new features to sell* . . . with new *low* anniversary prices that will make Kelvinator the "value" line of the year.

Behind it is the practical, effective sales training program of the Kelvinator National Salesmen's Institute, turning lookers-around into buyers, demonstrations into sales, store traffic into profits.

All this means that 1939 is going to be Kelvinator's big year . . . *your* big year, too—if you include Kelvinator in your plans. Don't just wish you had—get your share of the profits now. IT'S NOT TOO LATE!



Perfected Product of a Quarter-Century!

TODAY, Kelvinator adds a fitting climax to its first 25 years of pioneering . . . by introducing the new Silver Jubilee models . . . modern . . . beautiful . . . sensational . . . as revolutionary as the first Kelvinator that introduced electric refrigeration.

These new "selling features" give you the opportunity to make 1939 a volume year for you and your salesmen.

NEW! Conditioned Cold—the latest refrigeration discovery . . . flavor protection in special compartments for meats, vegetables, and frozen desserts.

NEW! The Polarsphere—considered the most efficient cold-producing unit made. Completely sealed in a welded steel ball . . . produces cold power enough for five refrigerators.

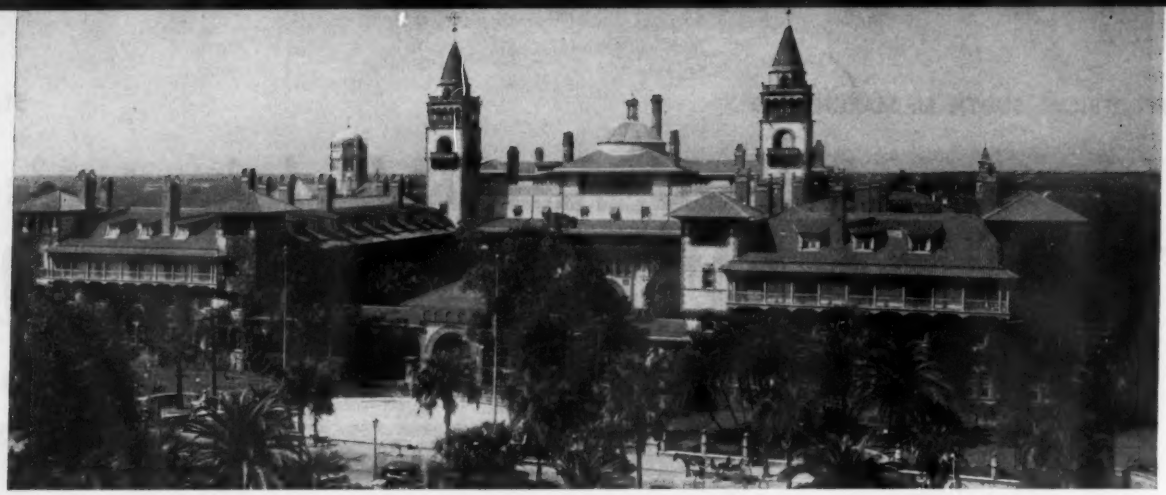
NEW! "Family Planned" interior . . . shelving arranged to end groping and fumbling. New wider front, less depth, more storage space.

NEW! Vegetable Bin. Dry storage for nearly two bushels of onions, potatoes, squash, etc. Tilts open easily. Attractive chromium type handle.

Kelvinator, Division of Nash-Kelvinator Corp., Detroit, Michigan.

Silver Jubilee KELVINATOR

BE IN THE SPOTLIGHT WITH KELVINATOR IN 1939



Southeastern Electric Exchange To Meet in St. Augustine

ELECTRIC utility executives will have a real opportunity to mix business with pleasure when they attend the sixth annual conference of the Southeastern Electric Exchange at the Ponce de Leon Hotel, St. Augustine, Florida, March 30, 31 and April 1.

St. Augustine, known primarily as the oldest city in the United States, is unquestionably one of the most interesting historic cities in the country and provides countless opportunities for entertainment and recreation.

Excellent fishing is available the year around. Matanzas Bay and River afford miles of protected waters for boating and yachting. Three marvelous beaches, within a few minutes of the heart of the city, offer the finest surf bathing to be found anywhere. And for the golfer, three excellent courses are available.

One of the outstanding points of interest near St. Augustine is Marineland known as "the world's only oceanarium." The Marine Studios present the mysterious undersea world as an actual and living drama in the world's largest aquarium tanks. Instead of being segregated, the specimens of marine life are all swimming freely together in two giant aquarium tanks, living much as they do in the open sea.

Varied Business Program

An unusual business program has been arranged which should in itself make this year's conference a record-breaker in attendance.

President Bryan C. Hanks will open the meeting with a few introductory remarks.

Addresses on particularly timely subjects will be presented by Owen D. Young, chairman of the board, General Electric Company, and Major Clark Howell, editor and publisher, *Atlanta Constitution.* Mr. Young will speak on "What is the National Program?" and Mr. Howell's subject will be "The Economic Possibilities of the South."

The general subject of public relations will also receive a prominent place on the conference program. "As a Cross-Roads Scribe Sees Your Problem," will be the subject of Clayton Rand, editor and publisher, *Mississippi Guide,* Gulfport, and Jay Johns will speak on "A Newcomer's Viewpoint of the Utility Industry." Mr. Johns is chairman of the Board of Directors of the Virginia Public Service Company, Charlottesville.

"Power Transmission During National Emergency," will be the subject of an address by M. W. Smith, vice president, Westinghouse Electric & Manufacturing Company, Pittsburgh. Another paper dealing with the broader operating problems of electric utilities will be titled "Profitable System Load Building." The latter address will be presented by Major H. S. Bennion, Edison Electric Institute, New York City.

The Ponce de Leon Hotel, with its red tile roof, towers, domes and lavishly decorated arched gateways, is one of the finest examples of Spanish Renaissance architecture

Sharks, porpoises, penguins, rays, seacows, angel fish and jewfish are but a few of the specimens living in this "ocanarium"

An unusual attraction in St. Augustine is the new Marine Studio. Hundreds of marine specimens are visible through glass windows in two large tanks

Other speakers scheduled for the conference and their subjects are: "What to Do About Man Power," Dr. Richard S. Schultz, president, The Psychological Corporation, New York City; "Let's Speak English," Edwin Vennard, vice president, Middle West Service Company, Chicago; "Labor Regulations of Interstate Utilities," T. Justin Moore, General Counsel, Virginia Electric and Power Company, Richmond; "The Utilities at the Crossroads," H. F. Smiddy, Ebasco Services, Inc., New York City. and "Selling Service," by R. B. Roberts, general sales manager, Florida Power and Light Co.

"As an Economist Sees Your Problem" will be the title of an address by Dr. Truman C. Bigham, University of Florida. Another address scheduled for the conference will be presented by Senator Scott M. Loftin, of Jacksonville, whose subject will be "The Business Man as a Citizen."

The conference banquet, Friday evening, will conclude the meeting. Dr. John J. Tigert, president, University of Florida, will serve as Toastmaster. Guest speaker will be Dr. J. S. Thomas, president, Clarkson Memorial College of Technology, Pottsdam, N. Y.

Because of the unusually active year enjoyed by the various working sections of the Exchange, the reports of the various section chairmen should be received with considerable interest. W. A. Moore, vice president, Mississippi Power and Light Company, Jackson, Mississippi, will report the accomplishments of the Employee Activities Committee. The activities of the Engineering and Operation Section will be discussed by R. I. Butterworth, general superintendent, East Tennessee Light and Power Company, Bristol, Tennessee. Herman W. Boozer, general auditor, Georgia Power Company, Atlanta, will discuss the activities of the Accounting Section; while S. P. Vecker, general sales man-

The Hotel is a show place in itself. At left is the Venido Room. Below is the romantic patio

ager, Carolina Power and Light Company, Raleigh, will report the activities of the Sales Section.

An unusually attractive program has been arranged for ladies in attendance. A sight seeing tour Thursday morning will provide an opportunity to view the Oldest House, Fountain of Youth, Fort Marion and the Florida Alligator Farm. This trip will be followed by a luncheon at the Country Club.

Thursday afternoon's entertainment will include a bridge party at the Country Club; a walking sight seeing tour which will include the Old Slave Market, Burt House, Old Governors Mansion, Don Toledo House, St. Patricks Cathedral, and several of the oldest churches. Moving pictures, music and dancing will round out the program.

A bingo and roulette party with prizes for the ladies has been arranged for Friday morning. Visits to the Marine Studios and the Spanish Fiesta will be features of the Friday afternoon program.

Amicable Settlement For TVA Controversies

ANNOUNCEMENT was made February 4 that a tentative agreement had been reached to transfer the electric power properties of the Commonwealth and Southern Corporation in Tennessee to the Tennessee Valley Authority and local public agencies for approximately $80,000,000.

Many electrical utility executives in the South found encouragement in the fact that the tentative agreement included a number of major concessions on the part of TVA such as: (1) recognition for the first time of equity or common stock value in utility systems; (2) recognition of going business value in utility financial structures; and (2) recognition of investments not strictly for purchase of operating property.

With this controversial problem apparently settled amicably, it is anticipated that other operating companies will complete agreements with TVA in the very near future. Announcement was made recently that the holdings of the Alabama Power Company in the northern portion of the state may be sold to TVA for approximately $40,000,000. In addition to agreement on price, one of the chief obstacles to the sale has been the satisfactory establishment of a line to bound the territory in which TVA and Alabama Power Company will conduct their respective operations.

Later in the month, the city of Memphis and TVA reached a tentative agreement with the Memphis Power and Light Company whereby they will buy all of the company's facilities for $17,360,000 Of this amount, TVA will pay $2,110,000 for certain transmission lines.

The Memphis Power and Light Company under the terms of the agreement, will retain one large generating plant and high-tension transmission lines leading to Arkansas and Mississippi and more than $4,000,000 of quick assets including securities, cash and receivables.

Executive Personnel of Louisiana Utility Changed

Resignation of McGregor Smith as president and general manager of the Louisiana Power and Light Company, Algiers, La., and the election of W. O. Turner to succeed him was announced recently.

Mr. Smith, who has been with the company since its formation in 1927, resigned to accept an executive position with the Florida Power and Light Company of Miami. Mr. Turner, who has been with the company for eleven years, served as vice president in charge of operations until his elevation to the presidency.

Virginia Utility Announces Improvements for 1939

The Virginia Electric and Power Company will spend $6,144,595 for improvements this year, according to announcement by J. G. Holtzclaw, president, following approval of the budget by the board of directors.

The sum of $3,409,758 has been allocated to the 40,000-kilowatt addition to the 12th Street power plant, where work already is in progress. Improvements and extensions to the electric transmission and distribution system will aggregate $1,985,350.

About 200 miles of line will be built in rural territories throughout the system in Virginia and North Carolina.

Interesting Program Planned for Southwestern AIEE Meeting

PLANS for the annual meeting of the Southwest District, American Institute of Electrical Engineers, are rapidly nearing completion. The meeting will be held in Houston, Texas, April 17, 18 and 19. Convention headquarters will be in the Rice Hotel. The program will include technical sessions on various subjects of particular interest to the Southwest, three student sessions, and many attractive entertainment features.

The city of Houston offers unusual opportunities to visitors interested in engineering and industry. It is fifty miles inland from the Gulf of Mexico, yet it is the nation's third largest seaport. On both sides of the ship channel are many industries and vast oil refineries. Nearby is the San Jacinto Battleground with its magnificent monument and the famous San Jacinto Inn.

Fifty miles to the south are the beaches of the Gulf of Mexico at the island city of Galveston with its new causeway connecting it to the mainland.

Houston is virtually surrounded by oil and gas wells which may be seen in any degree of completion from many of the highways entering the city. One thousand oil companies have offices in Houston. Within fifty miles are the Gulf Coast sulphur mines where most of the world's supply of natural sulphur is obtained.

The technical program will present a variety of papers on such subjects as electrical equipment for oil field tool manufacturing, power plants, voltage regulators, carrier telephone systems, relays, electrical aspects of petroleum prospecting, design of condenser type bushings, short circuit forces in bus structures, substations, symmetrical components, signalling, phase angle control and symposia on pipe line corrosion and operating experience with rural lines. Approximately twelve papers will be presented in the vari-

(*Continued on page* 64)

Distribution Problems Discussed By Southeastern Engineers

THE ever-increasing range of the utility engineer's activities was well emphasized in the program of the meeting of the Engineering and Operation Section, Southeastern Electric Exchange, which was held in Raleigh, N. C., February 23 and 24. Although the largest part of the program was devoted to the discussion of technical operating and designing problems, such subjects as the federal wage and hour law and its application to electric utilities, personnel management, and simplified residence wiring, also had a prominent place on the program.

Nearly one hundred engineering members and visitors in attendance were welcomed to Raleigh by H. B. Robinson, operating superintendent, Carolina Power and Light Company, at the opening session Thursday morning. R. I. Butterworth, general superintendent, East Tennessee Light and Power Company, and chairman of the section, presided over the meeting.

A general discussion of the federal wage and hour law and its application to electric utilities was presented by C. B. McManus, assistant operating manager, Georgia Power Company. Mr. McManus also outlined the steps taken in his own organization to assure compliance with the law. From the discussion that followed Mr. McManus's address, it would appear that most companies in the Southeast intend to interpret the law liberally, in so far as their employees are concerned, and revise such operating practices as may be necessary to comply with the law.

Expulsion Tube Experience

Experience with expulsion tubes on transmission lines was the subject of a paper presented by F. H. Meece, Carolina Power and Light Company. This company operates considerable lengths of both steel tower and wood-H-frame transmission lines operating at 110 kv which are fully equipped with expulsion protective gaps. In addition, the company operates sections of considerable length of both types of construction which are partially equipped with expulsion tubes. Mr. Meece described in considerable detail the company's experience with this equipment during the five years most of it has been in operation.

Mr. Meece's study of the operating record of these lines would indicate that the tubes have been highly efficient in reducing line tripouts due to flashover on the wood-H-frame line. However, there would appear to be room for improvement in the accomplishment of this end in the operation of the steel tower line. Damage to insulators and fittings due to flashover on the steel tower line has been greatly reduced and it is believed that installation of armor rods will practically eliminate conductor burning.

The subject of high voltage step type regulators was discussed by J. I. Onarheim, electrical engineer, Allis-Chalmers Manufacturing Company. Mr. Onarheim reviewed the development of this type of equipment and described the theory of operation and constructional details of modern step type regulators.

Step Regulator Control

Mr. Onarheim emphasized particularly the use of time delay in the control of step type regulators. He pointed out that time delay is usually employed in the control of regulating transformers, because it permits setting the "raise" and "lower" contacts of the voltage relay at their proper value without obtaining unnecessary operations of the regulator as a result of transient voltage changes.

"Simplified Wiring" was the subject of paper presented by P. J. Carlin, superintendent of distribution, Florida Power & Light Company. Mr. Carlin presented a series of what might be considered basic facts on the simplified wiring methods developed during the past few years. He pointed out that his company has had little experience with this type of wiring and that the data and experience presented was based upon the activities of other companies and was offered for the purpose of initiating a general discussion on the subject.

Man Power Efficiency

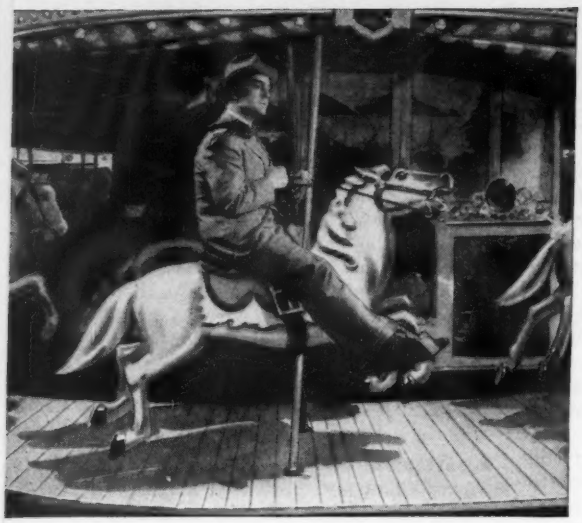
W. E. Brown, manager electric department, Virginia Electric and Power Company, presented a most interesting paper on the subject "Increasing Efficiency in Use of Man Power." Mr. Brown described his company's procedure in handling work in the distribution department.

"Every job is worked out in detail with a sketch showing the location and the work to be done in the field," Mr. Brown reported. "This is done by the distribution engineers in cooperation with the assistant general foreman. Each job has a detailed list of material required and an estimate of the labor cost. After proper approval and release, the jobs are turned over to the general foreman, with stock slips for the required material attached. The jobs and stock slips are assigned to the line foreman. Each foreman has available a complete copy of our distribution standards.

"The line trucks are stored in the garage backed up to a concrete platform along the back side of the garage at the same level as the truck body which platform connects with the floor of the storeroom located behind the garage in the same building. The line foreman turns the stock slips over to the storekeeper the first thing in the morning and by the time the crew is ready the storekeeper has trucked the material to the platform behind each truck. A minimum of time and labor is thus required and everything needed is furnished.

"Once a month the safety director inspects the pikes, hand lines,

WHY SELL AT ALL IF YO



THE LEONARD WAY OF DOING BUSINESS IS A PATH TO A PROFIT

Dealers, tired of merry-go-round selling—lots of work without getting anywhere—are asking to hear Leonard's story for 1939

A MERRY-GO-ROUND rider can travel a long time and get off exactly where he got on.

A dealer can sell a lot of refrigerators and come to the end of the year exactly where he started. It's happened before this.

The Leonard Way of Doing Business aims at a net profit rather than mere volume.

First of all, merchandise must be kept moving. You can't make money with your capital tied up in a warehouse. Neither can we. So sales *by* dealers mean more to Leonard than sales *to* dealers.

Dealer problems must be recognized as factory problems. So ours is a shirt sleeve partnership. If you have headaches we want to know about them. We want to help you to *sell* rather than "gang up" on you to *buy*. Naturally we want you to have Leonard refrigerators in stock. But not one red cent's worth more than you can sell.

We, too, think about net at the end of the year. We couldn't show a profit if we had to build a new dealer organization every year.

The only way we know to keep dealers from year to year is to help them to make *their* profit—and we *do* keep them.

That's the real, low-down on the Leonard Way of Doing Business. And that's why our whole program is tailored to fit you and your own sales problems.

One dealer—and a typical dealer, by the way—said the other day, "Leonard treats me as an individual. And both the factory and my distributor seem to think *my* problems are just as important as their own. My net is what seems to count with Leonard." LEONARD, 14250 Plymouth Road, Detroit, Michigan.

IT'S EASIER TO MAKE MONEY WITH THE LEONARD WAY

YOU DON'T MAKE MONEY?

MORE FAMILIES, FOR MORE YEARS, HAVE KEPT THEIR FOOD SAFE IN LEONARD THAN IN ANY OTHER REFRIGERATOR

This statement is in itself an additional guaranty of quality and performance—the kind of a guaranty that refrigeration shoppers appreciate. It backs up the brilliant array of selling features which they can see for themselves—or which you can demonstrate—the stainless steel Zero-Freezer, the "Ice-Popper" Trays, the Master Dial, the Vegetable Bin, the Meat File, the Show-Case Food File, the 3-Way Len-A-Latch, the Rearranging Shelf and, of course, the economical, trouble-proof, quiet Glacier Sealed Unit.

Leonard Travels in Good Company

Albany, N. Y.	E. S. & E. Co., Inc.
Altoona, Pa.	Electric Appliance Distributors
Amarillo, Tex.	Nunn Electric Co.
Atlanta, Ga.	Lamar-Rankin Co.
Binghamton, N. Y.	Morris Distributing Co.
Birmingham, Ala.	Magic City Appliance Co.
Boise, Idaho	Bertram Motor Supply Co.
Boston, Mass.	J. H. Burke Co.
Buffalo, N. Y.	Joseph Strauss Co.
Charleston, W. Va.	Eskew, Smith & Cannon
Charlotte, N. C.	Page-Williamson, Inc.
Chicago, Ill.	L. C. Wiswell Co.
Cincinnati, Ohio	Schuster Electric Co.
Cleveland, Ohio	Arnold Wholesale Corp.
Columbus, Ohio	Appliance Distributing Co.
Dallas, Texas	Praslee-Gaulbert Corp.
Dayton, Ohio	York Supply Co.
Decatur, Ill.	Linn & Scruggs
Denver, Colo.	Hendrie & Bolthoff Co.
Des Moines, Iowa	A. A. Schneiderhahn Co.
Detroit, Mich.	Buhl Sons Co.
Dodge City, Kans.	Mullin Furniture Co.
Escanaba, Mich.	Delta Hardware Co.
Grand Rapids, Mich.	J. A. White Distributing Co.
Harrisburg, Pa.	Knerr, Inc.
Indianapolis, Ind.	United Distributing Co.
Kansas City, Mo.	Federal Distributing Co.
Knoxville, Tenn.	Maytag Appliance Co.
Los Angeles, Cal.	Graybar Electric Co.
Louisville, Ky.	Stratton-Terstegge Co.
Memphis, Tenn.	Harry T. Wilson Co.
Miami, Florida	Major Appliances, Inc.
Milwaukee, Wisc.	Taylor Electric Co.
Minneapolis, Minn.	Enger Supply Co.
Montgomery, Ala.	Mathews Furniture Co.
Nashville, Tenn.	Nashville Chair Co.
Newark, N. J.	E. B. Latham Co.
Newburgh, N. Y.	Shapiro Sporting Goods Co.
New Haven, Conn.	H. M. Tower Corp.
New Orleans, La.	Radio Specialty Corp.
New York, N. Y.	E. B. Latham Co.
Omaha, Nebr.	Paramount Radio Shop, Inc.
Paducah, Ky.	Cleaves & Son
Peoria, Ill.	Cohen Furniture Co.
Philadelphia, Pa.	Motor Parts Co.
Phoenix, Ariz.	Graybar Electric Co.
Pittsburgh, Pa.	J. A. Williams Co.
Plattsburgh, N. Y.	A. H. Marshall Co.
Portland, Maine	Cressey & Allen
Portland, Ore.	Electrical Distributing, Inc.
Providence, R. I.	Ballou, Johnson & Nichols Co.
Richmond, Va.	Graybar Electric Co.
Rochester, N. Y.	Kemp Equipment Co.
Salt Lake City, Utah	United Electric Supply Co.
San Francisco, Cal.	Graybar Electric Co.
Scranton, Pa.	Household Appliance Distributors
South Bend, Ind.	Cloud Bros.
Syracuse, N. Y.	Morris Distributing Co.
Toledo, Ohio	Electric Range & Equip. Co.
Trenton, N. J.	Adams Distributing Co.
Tulsa, Okla.	Otasco Supply Co.
Washington, D. C.	Southern Wholesalers, Inc.
Williamson, W. Va.	Persinger Supply Co.

★

Y of Doing Business

blocks and tackle, ladders, saws, hammers, chisels, all rubber goods and miscellaneous equipment on each line truck. Any equipment he considers hazardous or unsafe is condemned, and replaced with new equipment.

"He also inspects the personal equipment of each man and condemns any considered unsafe.

"The safety director and the general foreman together also visit each line crew on the job once a month. The men stop work, have a thirty minute safety meeting where they practice rescue and artificial respiration. They are also instructed in how to properly place themselves and safety rubber equipment up the pole to do their work in the safest manner. Also, one man on each truck is selected by the men on the truck as their safety representative. He keeps in contact with the safety supervisor, helps to report injuries and accident and treats minor cuts."

Mr. Brown directed particular attention to the fact that each year since 1930 his company has competed in the public utilities safety contest sponsored by the National Safety Council. During this period the company worked up from ninth place in the 1930-31 contest to first place in the 1937-38 contest. During this latter contest period, the Virginia Electric and Power Company had only 2.5 lost time accidents per million man-hours worked.

This record was achieved, Mr. Brown said, in spite of the fact that the company's business had increased approximately 50 per cent during this period.

Closely related to the address presented by Mr. Brown, was that of L. M. Shadgett, division manager, Georgia Power Company, and also chairman of safety committee, Edison Electric Institute, whose subject was "Safe Practice in the Maintenance of Distribution Circuits."

"In general," Mr. Shadgett reported, "the composite experience of our industry indicates that the more important causes of accidents, listed in the order of their relative responsibility, are:

"(1) Employee practices (such as lack of attentiveness, discipline, care in handling of tools, etc.)

"(2) Precautionary measures (which would include improper or inadequate protective devices and methods.)

"(3) Physical or mental condition of employees.

"(4) Planning (under which would fall such causes as improper or inadequate instructions.)

Citing the experiences of one company as an example, Mrs. Shadgett pointed out that of the serious accidents resulting from these causes during a single year, 60 per cent were the result of employee practices, 23 per cent were the result of improper or inadequate precautionary measures, 6 per cent were the result of the physical or mental condition of employees, and the remaining 11 per cent appeared to be the result of inadequate planning of the work.

Mr. Shadgett stated that data compiled very carefully for many years by the accident prevention committee of the Edison Electric Institute indicated very definitely that the men who work on overhead lines, particularly distribution lines, are receiving more injuries, more severe injuries, and are losing more time due to injuries than other electric utility employees engaged in other phases of the business. This statement applies not only to the total number of accidents, he said, but also to number of accidents in proportion to number of employees.

In other words, he continued, those men whose work includes the maintenance of our distribution circuits seem to be the ones in most need of safer working practices, and there is more opportunity for improvement in this respect in this particular field than in any other occupation or phase in our business.

Mr. Shadgett recommended that more attention be given to the selection and training of foremen and linemen; and to determination under what conditions protective devices such as rubber gloves, line hose, rubber blankets, etc., must be used.

Among others who addressed the engineering group were R. L. Whitney, manager, porcelain department, Westinghouse Electric and Mfg. Co.; M. C. Miller, electrical engineer, Ebasco Services, Inc.; and Charles C. Jones, electrical engineer, Alabama Power Company. Excerpts from their talks will be found in following pages.

RADIO INTERFERENCE-PROOF INSULATOR DEVELOPMENT

By R. L. Whitney*

Sales Manager, Porcelain Dept.
Westinghouse Elec. & Mfg. Co.

IN 1925 or there abouts the A-C receiver was offered to a clamoring public already punch drunk from the assimilation of a new household necessity. Little did any of us realize at first that with the installation of the first A-C receiver a major problem in customer relations had come into being. It wasn't long though before we were all acutely aware of it.

In 1926 our Company, in common with all the other major manufacturers of insulators, was asked to find a means of correcting the radio noise generated by insulators on transmission and distribution lines. Utilities operating high voltage pin type lines through towns and cities were the most insistent because their trouble was the most acute. As the sensitivity of the radio set increased and the urge to find and log distant stations became almost a national mania, the pressure on the insulator manufacturers really became terrific.

The problem of radio interference first involved a determination of what actually caused it. It was definitely established that the minute air gaps between conductor or tie wire and insulator became overstressed at voltages far below operating voltage causing them to break down into tiny arcs. Those arcs generated radio frequency energy which was carried along the conductor by carrier effect and was broadcast from the line so the distress area extended some distance on each side of it.

In 1927 a large operating company in the east found, in a city

**Adapted from an address before the Engineering and Operation Section of the Southeastern Electric Exchange, Raleigh, N. C., Feb. 23 and 24, 1939.*

of fair size, that an area almost six blocks wide across the city was completely blanketed by noise. Even local stations were unable to get through the din produced by the insulators on a 66 kv pin type line. Four manufacturing companies submitted samples of their particular insulator which showed the greatest promise so far as the elimination of radio noise was concerned.

In every case the four engineering departments had approached the problem from the same angle. Each company had proposed to eliminate radio noise by reducing the resistance of the contact between conductor and insulator. There were three different ways of doing that, represented by samples, but isn't it significant that those four engineering organizations were so unanimous in their choice of a proper solution? It is even more significant that the method chosen should remain, today, the universally accepted corrective.

Of the four sets of samples submitted for this first purchase of radio interference proof insulator, it happened, and I use that word "happen" deliberately, that the Westinghouse design was selected. Our unit was a standard multipart insulator having the tie and conductor wire grooves treated with a metallic glaze, the active elements of which were platinum and gold.

Grooves Only Treated

The metal glaze on the unit developed was confined wholly to the two grooves. It was applied to the head of the unit before assembly and then the head was refired at a temperature lower than vitrification temperature. The normal silicate glaze and the metallic glaze matured to a low resistance band providing an easy path for the charging current between conductor or tie wire and porcelain free of any overstressed air gaps and, therefore, free of interfering arcs.

Frankly our unit was selected because of the apparent permanency of the treatment rather than any demonstrable superiority of performance because measuring devices were not then capable of distinguishing between performance of the samples of the various manufacturers. We thought and our customer was convinced we had the answer. Let it be said here and now that there was no guarantee of perfection because neither we nor anyone else knew how successful the insulator would be and we all *knew* we did not know.

Westinghouse insulator production line showing new type units.

The insulator was a failure. While we had eliminated the arcing flow of charging current, we had transferred the point of stress from the immediate contact area to the edge of our metallic band. Tangential corona defeated us. Our customer was forced to reinsulate the city portion of his line with quiet, suspension insulators and use choke coils to keep the noise generated on the rest of the line from entering the urban area—a costly process.

Our own and the engineering departments of our larger competitors continued their work. Before any major improvement on the insulator was achieved, a meter and a measuring technique were worked out. In 1930 our Company patented a then perfected glaze which overcame the objections of our first presumably radio free insulator.

First Successful Unit

Our first successful radio interference proof insulator used two glazes. In this case, however, both glazes were applied to the insulator before it was fired. Both glazes matured at the vitrification temperature of the porcelain. One of those glazes was the normal silicate glaze. The second glaze was also a silicate glaze but one of the active elements was copper oxide. This second glaze was slightly conducting after it was fired and its surface could be reduced chemically to metallic copper.

The upper area of the insulator was covered with copper oxide glaze before firing. In this case, the area so covered extended below the tie wire groove. It covered a small portion of the upper surface of the top skirt. After firing and before final assembly, the immediate tie was reduced to metallic copper, wire and conductor groove area treated with a soldering flux and dipped in a solder pot so the reduced area was completely covered with chemically inert but highly conducting solder.

As was the case with the first attempt, we provided metal to metal contact between tie wire or conductor and the insulator. That eliminated any possibility of overstressed air gaps and, therefore, of disturbing arcs. Since the oxide glaze was slightly conducting but had high resistivity, the potential drop between the edge of the metallized area and the outer edge of the conducting area was such as to prevent the formation of tangential corona. Therefore, the insulator was quiet and since exact measurements could be made, a guarantee against radio interference at the insulator was possible. Noise free high and low voltage lines were feasible and were built permitting your customer to hear his favorite program without insulator generated interference.

The treatment was mechanically stable because it was a part of the insulator itself and involved no design changes in the porcelain part of the insulator. It was chemically stable because the materials used were wholly inert and could not be affected by any atmosphere that would not attack the normal silicate glaze. Electrically, it was effective because it eliminated the

distressing noise completely without materially affecting the electrical characteristics of the insulator. The permanency of the treatment had to be attested in service however.

Our company, however, was still not satisfied since our method of producing a radio interference free insulator was, in common with all other methods in use, quite expensive. The radio interference free line was more expensive than the noisy line because the insulator cost more. While we were getting our field experience to prove the permanency of our treatment, we were working with the problem of reducing the cost of our treatment. Last summer that work was completed.

We have been able by adding certain controls to our metallic oxide glaze to increase its conductivity to the point where the expensive metallized head is no longer necessary. The resistivity of the oxide glaze is high enough that by accurately locating the area of the treated surface we keep the potential at the edge of that area below the corona point. The charging current is introduced into the porcelain without arcs. The insulator factory cost is not appreciably greater than that of the old standard unit.

Specifically the glaze used to obtain radio interference free performance is a water suspension of glass making raw materials to which is added a definite percentage of certain oxide salts. The glass making ingredients operate as a binder for the conducting oxides although as the glaze matures all of the ingredients pass into solid solution. The glaze is applied in exactly the same manner as the normal silicate glaze. Both before and after firing, the ware is handled, tested and packed no differently than the old standard ware. To you people this means that the skilled and unskilled workmen we both use do not have to learn any new or unusual tricks to produce or install the treated insulator.

Whether or not any given level of noise can be tolerated depends entirely on the signal strength of the desired broadcast station at the receiving set. You know from driving around the country, listening to your car radio that broadcasting station signal strength varies radically, sometimes, in a restricted locality. What would be a tolerable level of interference at one point would be wholly intolerable at another point.

Wood cross arm construction on distribution lines helps as long as the pole and cross arm are dry, but it does rain and wood does absorb moisture. An insulator on a given pole then may generate no more than a tolerable level of interference today and tomorrow it may be a source of profane complaint from a nearby power user. The interference level of an untreated insulator then is unpredictable.

The treated unit, on the other hand, operates day in and day out in whatever situation with no change in interference level because it is manufactured to give minimum noise under the most adverse conditions. Guarantees are based on tests made with a direct coupled measuring device and with the insulator mounted on a grounded steel pin. This is of vital importance to you people since your distribution lines blanket your whole territory and actually enter your customers receiving sets.

High voltage pin type insulators offer a means of economically building both primary and secondary transmission lines. They have fallen into disrepute because they were just too noisy to tolerate under any circumstances. A new era for the high voltage pin type unit has opened. It is no longer a radio trouble maker, when it is correctly applied, even at voltages above normal operating voltage.

Suspension insulators are inherently quiet and suspension lines are normally free of distressing noise. There is a possible source of trouble here however. Occasionally, one or more units on a string of suspensions may become shorted out, placing on the line unit more voltage than the design of the line intended it to carry. On all suspensions of whatever make, corona appears between the lower edge of the cap and the upper surface of the shell at between 13 and 18 kv. At that voltage the air gap between the hardware and porcelain becomes overstressed and corona forms. A very narrow band of oxide glaze on the shell surface below the cap rim distributes that stress when it does occur and raises the voltage at which corona appears to a point that approaches the wet flashover point of the unit.

Apparatus or switch type insulators are inherently quiet but as was the case with suspension units an added safety factor is provided by applying a narrow band of oxide glaze under the lip of the cap. This band materially raises the corona point in the same manner as on the suspension insulator and the added safety factor does not affect cost.

If line insulators are eliminated as a source of radio noise then it becomes necessary to examine other line accessories. Fuse boxes, transformer bushings and similar line apparatus can spell doom to your customers' hopes for a quiet evening at home with the radio. Our industry has found that a noisy fuse box, for instance, becomes a wholly unobtrusive fellow when a proper area of the porcelain box has been coated with oxide glaze. Those ratings of bushings that have been found troublesome, quiet down with an oxide glaze ring properly placed to control corona or capacity current arcs. Wall and floor tubes cease to be sources of trouble when the inside of the tube is coated with oxide glaze.

DISTRIBUTION CAPACITORS RELIEVE LINE LOADS

By M. C. Miller*

Ebasco Services, Incorporated
New York, N. Y.

ALTHOUGH condensers are as old as the electrical industry, only a limited quantity was used on distribution systems prior to the advent two years ago, of the outdoor unit-type capacitors.

Even though the installed cost of capacitors has been reduced about 25 per cent in the last two years, due largely to the improved design adapting them to installation on poles and associated vol-

ume production, the general use of capacitors to the extent warranted is still lacking. One reason for this condition is the lack of appreciation on the part of many utility operators of the benefits which are possible from the application of capacitors to distribution circuits. Also, as with any new equipment, the question arises of reliability and operating troubles which may develop.

From studies of capacitor applications made by Ebasco engineers, it appears that capacitors would prove economical for gaining capacity on many distribution systems and lines, especially where power factors are abnormally low.

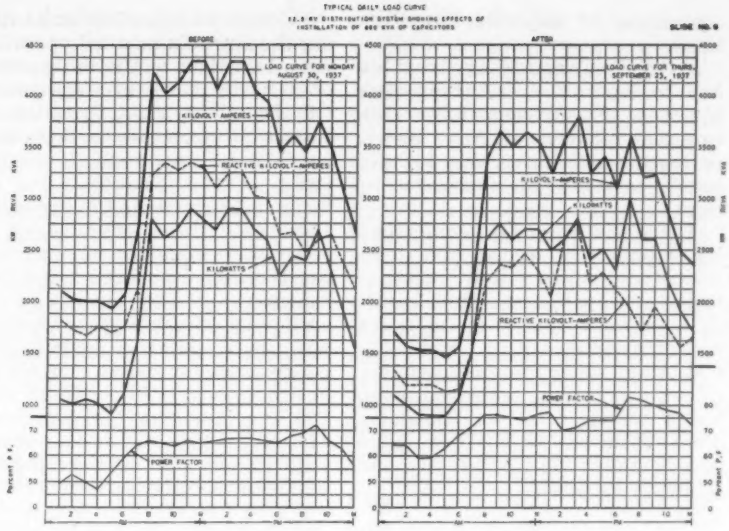
In many cases, capacitors may not be economical where voltage improvement only is required and load relief is not essential, or would not be obtained due to high power factor. Usually, where voltage improvement only is required, there may be more economical and satisfactory methods of correction. However, capacitors are worthy of careful consideration.

Where distribution substation bus voltage varies over a wide range with low voltage during heavy-load periods, and high voltage during light-load periods (the reverse of what is desired,) capacitors might aggravate an already bothersome condition. Perhaps scheduled control of the generation bus and transmission-line voltage would be worth studying.

35,000 kva Installed

Over 2,000 of the outdoor-type units, totaling 35,000 kva, were installed by Ebasco client companies in 1937. The units were mostly 2300 volts and installed on 2400-volt delta and 4160-volt wye systems. In one southern city the installation totaled about 12,000 kva; in another, 7500 kva. A few 4000-volt and 6900-volt units were installed.

Early in 1938, reports were received covering the performance of these capacitors during 1937. However, these had been in service only six or seven months, as the first units of this outdoor type were installed about May. Data were included showing reduction in kva loads on feeders and substation equipment, and voltage improvements; also, reports on failure and operating troubles.



These two charts show the results of installing 600 kva of capacitors on the 4160-volt distribution system, fed by 12,500-volt feeders, in another southern city.

Chart "before" shows the conditions prior to, and chart "after" the conditions following, the installation of these capacitors. Note that in August the peak was in the day time, with power factor around 0.65, with 0.71 on the then lighting peak. Chart "after" shows conditions a month later, during which time the capacitors were installed. Here the lighting peak is nearly equal to the 3 PM peak.

With the kilowatt load nearly the same, the kva was materially reduced and the power factor improved: on the day peak from around 0.65 to 0.75; and on the night peak from 0.71 to 0.81.

Most installations were made for load relief but incidental voltage improvement has been of great value.

In the city having 12,000 kva in capacitors installed, the capacitors are spread out over the city and it was not possible to switch all capacitors off and on for tests. The comparisons described are for a day during 1937 heavy-load season compared to a similar day for the previous year before any capacitors were installed.

For 12,000 kva of capacitors, an actual reduction of reactive kilovolt-amperes of 13,500 was obtained. This difference results from the increased kilovolt-amperes of the capacitors due to operation at voltages somewhat higher than the nominal rating, and from the reduction of I-squared-R losses in the feeders.

On the 4 PM peak the kilovolt-amperes were reduced 8,000—from 83,000 to 75,000—or 0.66 kva for each kva of capacitor installed. The power factor was improved from 0.77 to 0.86.

On the 8 PM peak, the kilovolt-amperes were reduced 6,200—from 78,000 to 71,800—or 0.51 kva for each capacitor kva, and power factor was improved from 0.85 to 0.92.

Of the 7,500 kva of capacitors installed on the other system mentioned, only 7,065 rated kva were in service when these tests were made which, operating at approximately 2,200 volts, which resulted in the actual capacitor kva being 6,676. The total reduction in reactive kva was 7,510. The difference between these two is due to reduced I-squared-R losses resulting from the lower current in the feeders on which these capacitors were installed.

This reduction in reactive kva reduced the total amperes on 28 feeders involved from 5,311 to 4,806, of 505—9½ per cent. The total kva on the 28 feeders was reduced from 36,744 to 33,282, or 3,462—or 0.52 kva for each kva of capacitor installed.

The tests indicated an appreciable reduction in kilowatt load. Calculations indicated that the I-squared-R loss at peak load on these feeders was reduced in the order of 500 kw.

Reports were received from other client companies showing comparable results from smaller installations. In nearly all cases, the installations of capacitors were for load relief—that is, to reduce the ampere loading on substation equipment and feeders. Voltage improvement was incidental but of considerable value and adds to the

**Adapted from an address before the Engineering and Operation Section of the Southeastern Electric Exchange, Raleigh, N. C., Feb. 23 and 24, 1939.*

economies of capacitor applications.

No serious operating troubles due to capacitors were reported by these client companies. No case was reported of fuses blown or capacitor failures, due to harmonic currents or series resonance.

There has been some conjecture by engineers of electric and telephone companies, that installations of capacitors would result in conditions requiring inductive coordination measures. From 35,000 kva of capacitors installed, the client companies reported seven cases where noise on telephone lines resulted—none that could not be taken care of readily and at small expense.

Failures of capacitor units during the first six months' operation were less than would be expected of a newly developed equipment. Of the 2,000 units installed by Ebasco client companies, there were only 12 failures (0.6 of one per cent)—9 from manufacturing defects and 3 attributed to lightning. Data on failures supplied us by capacitor engineers of manufacturers showed an even lower percentage for the capacitors installed by other utilities. A check with these engineers made in February this year shows that for the entire country, with around 200,000 kva installed, the percentage of failures reported is less than a half of one per cent during the eighteen months' period.

DISTRIBUTION SYSTEM FUSE and RELAY COORDINATION

By Charles C. Jones*

Electrical Engineer, Alabama Power Company

DUE to the fact that a large percentage of line faults are temporary, a scheme has been developed whereby instantaneous overcurrent attachments, inside or external to the induction relay, provide that all faults shall be cleared initially with no intentional time delay. This instantaneous relay is then disconnected from the circuit and if the fault was not cleared on the first operation, the induction element provides time enough to blow the sectionalizing fuse. The instantaneous element is restored to service at some predetermined time after the breaker has reclosed. This scheme requires the use of sectionalizing fuses of such size that they will not blow for the maximum current each may be subjected to within the clearing time required by the feeder breaker on its initial instantaneous operation.

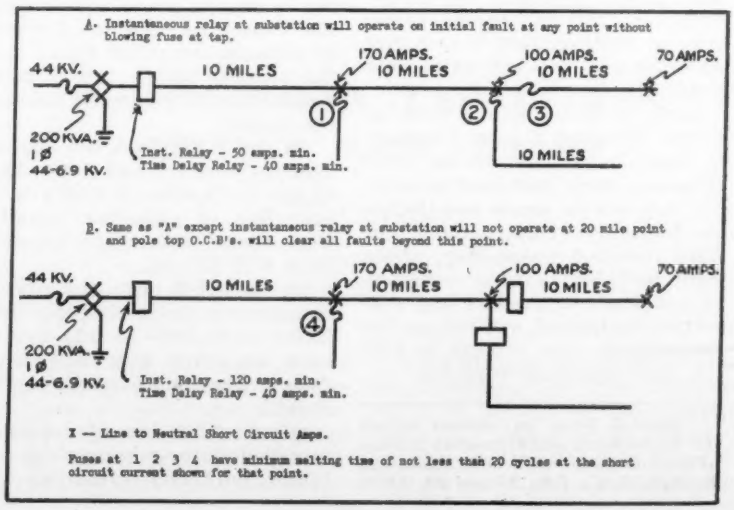
This scheme may not be desirable on urban circuits where there is important load close to the substation, but is very effective and saves many fuse operations on rural lines where momentary interruptions to the entire circuit may be tolerated.

In the accompanying figure, "A" shows a rural line with fused taps set up for instantaneous first tripping for faults at any point. "B" shows the same line except that instantaneous tripping pole top oil circuit breakers have been installed twenty miles from the substation. In this case, the instantaneous relay at the substation has been set up so that it will not operate at the twenty mile point. This allows the pole top breakers to protect the last ten miles of line.

A similar scheme may be used with one breaker supplying several circuits. In such a case, each circuit is fused at the substation with a fuse large enough to allow an instantaneous initial operation of the breaker without damage to the fuse. If the circuit is not clear when the breaker recloses, the fuse blows and clears the faulty line, thus leaving the other circuits in service.

Protection against faults involving only one wire and ground presents a different problem from protection against three phase faults. On delta low voltage systems, no appreciable current will flow for a ground on one phase; consequently no fuses can be blown and no relay operation will occur. On grounded-Y systems or single phase grounded lines, relay and fuse operation can be expected if the phase wire contacts the neutral wire. If this does not occur relay or fuse operation is doubtful, as the resistance of a wire in contact with the earth only is frequently too high to pass any appreciable current at distribution voltages.

On delta systems three potential transformers, connected grounded Y-delta, with a voltage relay inside the delta, will provide sensitive ground fault detection—too sensitive in many cases. As this method cannot distinguish which feeder is faulty, it is applicable chiefly to systems supplied through one breaker only. No fuses can be blown for ground faults. By installing a small grounding bank on the bus supplied by a delta-connected bank and installing one of


A. Instantaneous relay at substation will operate on initial fault at any point without blowing fuse at tap.
44 KV.
10 MILES
170 AMPS.
10 MILES
100 AMPS.
10 MILES
70 AMPS.
200 KVA.
1 Ø
44-6.9 KV.
Inst. Relay - 50 amps. min.
Time Delay Relay - 40 amps. min.
10 MILES
B. Same as "A" except instantaneous relay at substation will not operate at 20 mile point and pole top O.C.B's. will clear all faults beyond this point.
44 KV.
10 MILES
170 AMPS.
10 MILES
100 AMPS.
10 MILES
70 AMPS.
200 KVA.
1 Ø
44-6.9 KV.
Inst. Relay - 120 amps. min.
Time Delay Relay - 40 amps. min.
X — Line to Neutral Short Circuit Amps.
Fuses at 1 2 3 4 have minimum melting time of not less than 20 cycles at the short circuit current shown for that point.

*Adapted from an address before the Engineering and Operation Section of the Southeastern Electric Exchange, Raleigh, N. C., Feb. 23 and 24, 1939.

the recently developed zero sequence current transformers on each feeder sensitive and selective ground fault protection can be obtained. However, the fault current is limited and only the smaller fuses can be expected to blow.

The zero sequence current transformer consists of three primary windings and one secondary winding on the same core and has a ratio of approximately one to one for residual currents. Load current, three-phase, or phase-to-phase faults produce no residual current and thus produce no secondary current in this current transformer. Residual currents in one primary line of magnitudes from one-half ampere up can be transformed by this type of current transformer and used to operate a ground relay. Its application is chiefly to low voltage urban circuits.

Fuses for sectionalizing purposes have definite limitations, but also a definite field of application. They may be applied so as to reduce the line exposure on one feeder circuit breaker, or to isolate less important line sections or taps from the main line. Also, they may be necessary to protect line sections so distant from the source that the short circuit current is below a practical setting for the feeder oil circuit breaker. Fuses must be applied with a definite knowledge of short circuit values, as the fuse size which might be used for overload protection is usually not suitable for operation under fault conditions.

Where two or more fuses are to be operated in series, the short circuit current at each location must be known within reasonable limits in order to select the proper size link. It is not enough that the fuse nearest the source have a higher rating than the more distant one. There are definite maximum current values beyond which two fuses in series will blow together, even though the fuse link sizes vary materially. This point is determined in general by the point where the maximum clearing time-current curve of the smaller fuse crosses the minimum melting time-current curve of the larger fuse. For current values beyond this point, the larger fuse will blow or have its characteristics materially changed. In any case, the maximum current must not exceed that required to blow the larger fuse in one cycle or exceed the rating of the cutout in use.

For practical purposes it has been found necessary to use only one manufacturer's fuse links. In a few cases where some other manufacturer has a few links with time-current curves close enough to the ones normally in use, they may be interchanged. It frequently happens at certain locations that fuse links of different characterictics from the standard would be advantageous. This still appears impractical except at such locations as the high side of the distribution substation bank where special spare links are kept at all times.

Time-Current Curves

Any comprehensive co-ordination study requires accurate knowledge of the time-current characteristics of the fuse links to be used. These curves should include maximum clearing time curves at rated voltage and minimum melting time curves. Fuses with several different characteristic curves are available. Most of these have average melting times of three to ten seconds at 200% and .1 to .2 seconds at 1000% of rating. Some manufacturers are offering fuse links having more time delay at higher current values than those mentioned. These go as high as twenty seconds at 200% and 0.5 seconds at 1000%. This type curve is much more desirable than the faster fuses for sectionalizing purposes, as they conform more nearly to relay curves.

In applying fuses under relay curves, care must be taken to see that the relay curve does not cross the fuse curve twice. This may happen near the relay minimum setting when the fuse is operating above ten or fifteen seconds on its curve. This condition will cause incorrect operations of the breaker for light faults, such as faults on the secondaries of large distribution transformers, and is sometimes overlooked, as the points in question are frequently out of the range of the co-ordinate paper used for plotting the curves.

In places where reclosing service is required but oil circuit breakers are not justified, repeating fuses have definite advantages. Their use, however, involves several problems. In the first place, the relays back at the substation must be set to take care of the possibility of three successive operations at intervals of twenty to thirty cycles between fuse blowings. As the very inverse time induction relay is slow in resetting after it has partly closed its contacts, practically the sum of the maximum clearing time for each of the repeater fuses must be allowed.

Also if another sectionalizing fuse is in use on the source side of the repeater, much greater fuse size differences must be allowed in order to prevent unnecessary operations. Experience on some systems has shown that there is a limit to the distance that may be protected by one set of repeater fuses. This should not be over ten or fifteen line miles where lightning storms are frequent as inspection and maintenance costs will become excessive.

Experience has also shown that fuses smaller than 10 amperes are unsatisfactory for line sectionalizing, as they blow unnecessarily under transient fault conditions, such as de-ion gap spillovers on distribution transformer primaries. There is a tendency in some cases to use too many sectionalizing fuses, particularly in installations too close to a substation having reclosing breaker service. This obviously nullifies much of the value of the breaker. Also fuses close to the substation, where the short circuit current is highest, must be larger than those some distance away in order to allow for clearance of other fuses still more distant.

Recent developments in instantaneous tripping, multiple reclosing, pole top oil circuit breakers provide a last line of defense in the protection of single-phase taps supplying small loads. Due to their lack of time delay tripping characteristics, they can only be used where no fuse operations are expected beyond the point of application. These breakers are particularly suitable for taps where the distribution transformers are of the rural type with no isolating fuses, where the transformers are protected by gaps, or where the line is too long for application of repeater fuses. Present available breakers of this type have low continuous ratings and comparatively high minimum tripping values. The interrupting capacity is also very limited and care must be taken to see that this value is not exceeded. There is a definite field for a small reclosing breaker of this type; however, its application would be wider if time delay characteristics and variable tripping values could be incorporated.

Washington's Adequate Wiring Program

(*Continued from page* 50)

"House That Jack ($$) Rebuilt," a 100-year old frame dwelling that was moved to a downtown square on famous Pennsylvania Avenue and transformed into a modern model home almost in the shadow of the White House. The Electric Institute co-operated with the Junior Chamber of Commerce, sponsors of this modernization promotion, in presenting the first certified wiring award.

When the magazine "Life" undertook the construction in Washington of one of the 20 model homes being sponsored by this publication in 20 cities throughout the country, the commercial department of the Potomac Electric Power Co. contacted the builder and secured several added outlets and three more branch circuits in addition to those already included. The certification of this home not only received local newspaper mention but national publicity in "Life" as well.

Seeking an approach that will provide the opportunity for presenting the dramatic story that will sell adequate wiring to the housewife—and this is the real job, according to J. S. Bartlett, managing director of the Institute—a list of articles on wiring appearing recently in the four leading women's magazines has been compiled and sent to all contractors.

The Institute found, upon investigation, that 109,000 copies of these compilations were distributed in Washington alone. The articles, according to Mr. Bartlett, supply the key to the appeal the contractor must adopt in order to put over the advantages of improved wiring with the housewife.

A window display of the Electric Institute promoted the subject of adequate wiring in connection with the all-electric Life home

"WILL YOU PLUG MY ROASTER IN AGAIN—I WANT TO USE THE WASHING MACHINE ON MY OUTLET"

In the field of commercial wiring, the Institute has used an indirect approach by concentrating on the promotion of heavy electric equipment for restaurants and hotels. As a result of this campaign, 3000 hp in air conditioning equipment was installed in 1938. Over 250 kw of heavy duty commercial equipment was sold to restaurants.

This program initiated the sale of substantial amounts of wiring and materials. The restaurant installations promoted additional circuits and in some cases complete re-wiring of kitchens.

Plans Progress for AIEE Southwest Meeting

(*Continued from page* 54)

ous student sessions.

Three interesting inspection trips have been planned. One of these will include a visit to the Deepwater Power Plant of the Houston Lighting and Power Company—a plant of 147,000 kilowatts in capacity which includes a 1400 pound pressure turbine. This trip will also include a visit to the Champion Paper and Fibre Company's plant which manufactures paper from slash pine.

Another inspection trip will include visits to local and toll offices of the Southwestern Bell Telephone Company, the underground network system of the Houston Lighting and Power Company, and air conditioning plants in several large office buildings.

The third trip will include a visit to the Turning Basin and a short trip by launch on the ship channel. Visitors will have the opportunity of seeing the magnificent new monument at the San Jacinto Battleground and the nearby radio stations KPRC and KTRH.

The entertainment committee has planned several unusual treats including special entertainment for the ladies.

The general meeting committee under whose direction the meeting has been planned includes the following members: Dean F. C. Bolton, A. & M. College of Texas, vice president of the A.I.E.E. and chairman of Southwest District; Prof. H. C. Dillingham, A. & M. College of Texas, secretary, Southwest District; L. T. Blaisdell, General Electric Company; V. O. Clements, Westinghouse Electric & Manufacturing Company; and Seth Evans, Hughes Tool Company.

Chairmen of the various convention committees are as follows: entertainment committee, H. P. Heafer; attendance and publicity, J. B. Arthur; transportation and inspection, L. K. Del Homme; hotels and registration, H. F. Staacke; finance committee, E. M. Wise; meetings and papers, N. F. Rode; and student activities, N. F. Rode.

Arkansas Utility Has Active Wiring Campaign

(*Continued from page* 49)

as the customer. The former is urged in a personal letter from Mr. Tucker to insist on adequate wiring for each house on the line that he may contract to wire. The customer, also written a letter by Mr. Tucker, is urged to have the contractor submit a bid that will include adequate wiring with proper allowance for future equipment additions.

One of the most impressive wiring campaigns has been conducted through the monthly publication *Geared Sales* issued by the power company's Sales Promotion Division. This publication goes to dealers, contractors, and others and an effective educational campaign in behalf of simplified adequate wiring has been put across.

Direct-by-mail advertising, pointing out the advantage of adequate wiring will be mailed to commercial customers during 1939.

In addition, several hundred copies of "Adequate Wiring Reporter" will be mailed to all contractor-dealers in the power company's territory.

APPLIANCE Service

Servicing the Sealed-in Refrigerator Units

By Allen Parker

WITH the innovation of the sealed refrigerator unit came some good and some bad features, although most service men at first felt that all the features were bad. The primary reason for this attitude was that almost nothing could be done for them in the field other than adjust the control. And adjusting the control to make it either colder or warmer meant that the running period was adjusted for shorter or longer operation.

If this did not produce results, the service man was left in a bad predicament, since he could not get it replaced unless he could prove that it was inherently defective, and this did not cover a slow freezing unit.

Also there would have been a hesitancy on the part of the purchaser in buying a system that could not be repaired, if the manufacturers had not offered extended guarantees covering several years instead of the one year, which many men in the industry consider particularly undesirable.

This placed the additional responsibility on the service man of trying to make the sealed unit maintain the original efficiency although normal wear and tear was continually decreasing it. Many units were encountered that would not work during the summer months although they functioned perfectly in the winter; also some units which at their best had insufficient capacity for summer use.

But in spite of the obstacles facing the service man during the first few years after these units were introduced, he did receive some real benefits. He learned a new way of servicing refrigerators and instead of the conventional method of going out on a conventional job and changing everything that struck his fancy from an expansion valve to the control, he now found a type of job that permitted no adjustments other than the control.

This was just what the service man needed and what the manufacturer wanted. It provided the manufacturers with an opportunity to give the service man small doses of information over a long period of time, thus assuring that every bit of it would be eagerly accepted at its true value and not be forgotten.

The first lesson was how to purge a unit, and I believe it was immediately applied to every unit that had ever given trouble. The big surprise was that it worked in so many cases. As an example, a unit that was getting insufficient liquid to the evaporator could be traced to a stuck float and the stuck float could be traced to its being (as commonly known) air bound by inert gas and it could be immediately released by purging.

Adding gas to a new hermetically sealed refrigerator unit

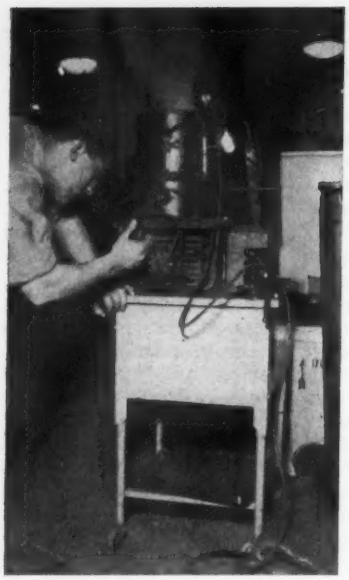
Also, jobs that were automatically cutting off from overload or too soon for proper refrigeration had their troubles traced to high head pressure and purging was also the remedy for this. So with this lesson so well instilled in every one's mind there seemed to be a tendency of some men to over do it. Once too much gas was let out there was insufficient refrigerant to do the job.

This problem was met by the manufacturers supplying a charging tool which did the trick on units that had low frost lines on the evaporators, sticking floats because of insufficient liquid, units that were slow in freezing, and those that ran all the time with poor refrigeration. These two lessons covered a multitude of troubles.

One of the greatest difficulties the manufacturers had to overcome in making a successful sealed unit was the eliminating of the non-condensing gas which accumulated in the unit over a period of years. It was found that much of this gas was generated from the motor windings as they were continually heated and cooled. This trouble has been reduced or practically eliminated since then by the use of imported long-staple cotton for winding insultation and a special varnish.

Some float valves that were stuck were the result of other causes than those mentioned above. But again, instead of simply replacing it as was usually done before, the manufacturer supplied a magnetic float valve lifter. In a good many cases a float valve that has stuck will begin normal operation again after being lifted once or twice.

Sometimes the unit itself will stick and of course the control will "kick out" from overload. Now there is available on the market a small auto transformer, to which the refrigerator unit can be connected. This transformer supplies a surge of 150 to 220 volts which will usually start the unit unless there is some permanent



Checking a sealed water cooling unit that has been removed from the cabinet

trouble. Most units will then run normally again.

Minor complaints in these sealed-type units will sometimes tax anyone's ability. For example, a metallic noise in a conventional model might require only the tightening of some loose part. On a sealed unit, it might be the result of operating the refrigerator on the back porch in winter. On the back porch, the lower temperature might cause the gas to liquify in the compressor body and thus cause the compressor to pump noisily. In the kitchen, with a higher temperature it might operate smoothly.

A sealed type unit also demands more attention in installation such as being accurately leveled up for quieter performance. Some model sealed units have an oil conditioner or oil heater that keeps the oil in the compressor base at proper temperature for correct lubrication. Often a noisy compressor can be traced to this heater unit being burned out but it can be replaced easily.

Auxiliary fans, on those models that have them, come in for their share of trouble. They seldom burn out but do slow up or stop and cause high head pressure which results in erratic operation and poor refrigeration. Sometimes fans get noisy. Most fan trouble is the result of insufficient lubrication, although they have an unusually large wool yarn and oil capacity reservoir which, when lubricated at the factory, is considered sufficient for several years.

Temporary remedies may be applied by oiling the fan on the unit but the only permanent remedy is to remove the fan; disassemble it; remove any abrasive caused from charred oil on the bearings which would ultimately cause bearing trouble; and then reassemble, giving it a complete charge of thin oil.

Controls on sealed units have a double duty to perform since they not only make and break contact at the proper temperature but also operate the automatic switch for the starting winding in units utilizing split-phase motors. Also, the thermal relay for overload is usually mounted in the control box.

The tendency in many cases when the unit is cutting off from low voltage or overload is to change the adjustment of the thermal relay. This not only fails to remedy the trouble, but invariably leads to greater trouble, since it is serving its useful purpose when it is cutting off because of the unusual operating conditions.

A volt meter will prove very useful in either confirming or eliminating the first possible cause. Once the voltage is found to be correct, the job of removing the overload is next to consider. Good ventilation is the next thing to consider as it enables the compressor to liquefy the gas faster, thereby increasing the capacity of the unit.

This is the most important observation to make when first checking a unit as many new homes have a niche or alcove built into the wall to make the front of the refrigerator flush with the wall. Such an arrangement will impair the capacity and operation of the unit. Even those with forced convection fans do not receive proper circulation of air under these conditions.

Occasionally, the service man will encounter a unit in which the overload or excessive current is caused by a short circuited motor winding. Sometimes, too, the customer just requires too much refrigeration from a small unit. But in any of these cases, adjustment of the control or thermal relay not only fails to remedy the trouble, but prolongs it with the possibility of it becoming more serious.

Chattering of the control is a frequent cause of trouble which can usually be traced to bad contact points. A small platinum file or a small piece of fine sandpaper can be used to clean the points and correct the trouble very nicely. A good many men attempt to correct the trouble by raising or lowering the contact points, and the simple method they have of doing this is to strike the points sharply with a pair of pliers. It is true that this works in some cases because the points make contact at a different angle with the likelihood of their being clean at the new point of contact. But service men who employ such methods are leaving themselves wide open for plenty of repeat calls of a similar nature because the adjustments he has changed were made with precision instruments at the factory to give the best results. In general, replacement of control parts in the field is not very satisfactory.

Another unusual control trouble results from bugs getting into the control box. Possibly this is because the control stays warm and is thus a good place for breeding. The sad part about them getting into the control is that occasionally one is between the contacts when they close, so naturally the refrigerator is out of operation until the points are cleaned.

The bugs, as a rule, are of the

(Continued on page 68)

Warm water in the evaporator and a blanket over the condenser will raise the head pressure sufficient to purge oil from the evaporator

MOTOR Service

Pointers on Proper Use of Paper Winding Cells

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

IN many low-voltage, direct-current, open-slot armatures, winding cells are used to protect the insulation on the armature coils while they are driven into the slots. These winding cells are generally made from fishpaper or other grades of paper, and with any type of paper winding cell there are some tricks and kinks that are helpful and that improve winding.

When fishpaper U-pieces are used, then the length of the cell should extend to the outer edge of the U-piece at each end of the core, as in Fig. 1. There are two types of paraffin-treated fishpaper, one treated on both sides and another treated on one side only. The latter is preferred for thin cells 0.007 or 0.010 inch thick, where additional side fillers are used, as there is less chance for the cell to pull down when driving in the coil. This type of fishpaper should have the untreated side next to the core iron; since such an arrangement provides better adhesion to the core iron when armatures are dipped and baked after winding.

The double-coated material, that is, with both sides treated, resists moisture absorption better when stored in large rolls in the cutting room; it also resists cutting action from irregular core iron in the slots.

When using paper winding cells in open slots a little trick when installing the cells will save time and prevent hangnails. When folding the cell, both sides should not be made of equal width, but one side should be about one-half inch longer than the other, Figs. 1 and 2.

The high side, Fig. 2, should be facing the direction from which the top half of the coil is pulled. Thus when feeling for the top slot, only one-half of the cells are pulled back and the wanted slot is exposed more quickly. Edges close together do not have to be separated. Figure 1 also shows the long and short cell side, as well as the proper placing of the long side of the cell in relation to the coil.

On armatures using left-hand coils and wound with the commutator on the left, the long side of the cell would be nearest the winder. On armatures using left-hand coils and wound with the commutator on the right, the short side of the cell would be nearest the winder.

When a tight slot fit is required and maximum protection is desired for the coil insulation, then the double-winding cell can be used. This system consists in using a narrow individual cell for the bottom coil half, of a width equal to twice the depth of the coil side plus one thickness of the coil side.

A bottom coil half in the bottom of the slot is shown in Fig. 2(b). The narrow bottom cell covers both sides and the bottom of the coil, or the cell width is (2D+W.). A top cell with sides projecting above the iron, one long and one short side, is also used as shown in Fig. 2(b).

The method of using the double

Fig. 1—(above) When U-pieces are used the winding cell should extend to the outer edge of the U-piece at each end of the core as shown here. The cell extends up higher on one side than on the other for easier working

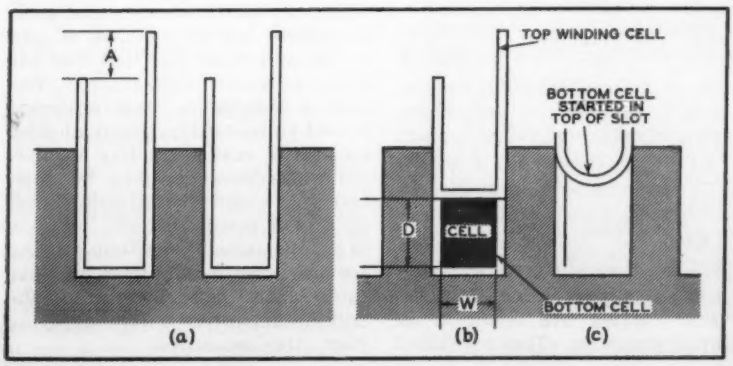


Fig. 2—(left) The differences in height in the cell sides is to be seen in (a) at the extreme left. A bottom coil half is shown in (b). Sketch (c) indicates how the bottom U is started

cell is as follows: the narrow bottom cells are bent into U shape and inserted in the top of the slot, Fig. 2(c). The bottom coil half or side is placed in the cell, then both coil and cell are driven down together.

When the top coil half is put in, a separate top cell is used. This cell receives the effect of the cutting and driving of the top coil half. The throw section of the winding is clear, and only a cell projects from those slots that contain the top coil halves; that is, the proper slot for the top coil half.

After a winder has tried the double-winding cell until he is familiar with it, he will find that it has a number of good points

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What Do You Know About Motors?

By A. C. Roe

THIS month our "True or False" statements will test your knowledge of an old type of A-C stator winding, in common use some years ago. Windings of this type are still encountered in motor repair work.

The winding referred to is the old "basket windings" which in many cases can be converted to the modern two-layer, two-coils-per-slot winding, with improved performance at less cost. In many repair shops that have adjustable moulds, for winding flat diamond mush coils in complete pole phase groups, the cost of a mould for a basket coil is eliminated, as it is difficult to obtain the proper basket coil shape on adjustable moulds.

Another saving in cost is the elimination of stub connections, with the necessary soldering, cleaning, and twisting the wires, insulating the joints, etc. Also, the two-layer winding coil ends only require one layer of cotton tape with fly pieces for phase insulation, against two layers of tape on all basket type coil ends.

The two-layer winding requires twice as many coils, but the other items mentioned above more than offset this disadvantage. The resulting two-layer winding is more economical and safer.

Use your pencil and underline your answer as to whether the statement is true or false; then turn to page 81 for the correct answers.

(1) A "basket winding" is formed on a bushel basket. True or False?

(2) In a "basket winding," there are half as many coils as there are slots. True or False?

(3) Modern materials such as glass insulated wire, glass tape, and glass sleeving, can be used to advantage on basket windings. True or False?

(4) The difference of potential between the coil ends of basket windings is lower than in two-layer, two-coils-per-slot windings. True or False?

(5) The coil pitch of a basket winding must always be an odd number, or an even number plus one, as 6+1=7. True or False?

(6) In a basket winding the number of coils per pole phase group is the same as in two-layer, two-coils-per-slot windings. True or False?

(7) The coils for basket windings are of the flat mush wound type. True or False?

(8) The top cell, or slot section, on basket winding coils is the longest. True or False?

(9) In basket winding coils, the longest leg of the mould is the top half. True or False?

(10) The leads on coils for basket windings should be brought out on the bottom leg. True or False?

(11) When taping the coil ends of basket windings, the tape should be tucked into the slot cell. True or False?

(12) Basket winding coils can be wound on gang moulds. True or False?

(13) The number of stub connections in a basket winding is only one-half the amount in a two-layer winding. True or False?

(14) The stub connections in a basket winding are made on the bottom section of the coil ends. True or False?

(15) The number of pole phase groups in a basket winding is one-half that in a two-layer, two-coils-per-slot winding. True or False?

(16) A basket winding can be changed to a two-layer, two-coils-per-slot, diamond mush coil winding. True or False?

(17) Odd coil groupings can be used with basket windings. True or False?

(18) With an odd grouping basket winding, a change to a two-coils-per-slot winding will result in an even coil grouping. True or False?

Servicing the Sealed-in Refrigerator Units

(*Continued from page* 66)

variety commonly known as water bugs. Incidentally, many a customer has been offended because the service man told her he was getting roaches out of the control. And sometimes the service man gets his own feelings hurt by the customer's remarks for there is a difference between water bugs and roaches. The remedy on most controls is to seal the openings where the leads enter with rubber grommets, and if this is not possible, roach powder is about the only solution.

Are you surprised that we have gone this far into this story on sealed units without mentioning the almost universally used method of speeding up a unit slow in freezing by heating the evaporator with a space heater or domestic iron, while the unit is running? Slow freezing units are often caused by oil accumulating in the evaporator and such units are referred to as being "oil bound" because the oil slows up the vaporizing of the refrigerant.

Heat applied at the evaporator causes violent boiling of the oil and refrigerant in the evaporator with the result that much of the oil reaches the suction line and returns to the compressor. The unit then operates normally for a time until the oil again accumulates.

A permanent remedy for such a case is to charge the unit with refrigerant until the frost line on the evaporator reaches the top of the evaporator, then excess oil will come into contact with the suction line and return to the compressor, leaving the refrigerant in the evaporator free to perform its specific duty.

The servicing of sealed units, if very extensive, demands good workmanship, because there are so many mistakes which once made, can never be corrected such as adding the wrong kind of gas or oil, or adding gas that has not been properly dehydrated. Too high a voltage for test purposes or test voltages improperly applied sometimes causes winding trouble. All these thoughts may be summarized in one general rule: that is, that a great deal can be done to sealed units in the field but the service man must first analyze each case and determine the trouble definitely before applying corrective measures.

WHOLESALERS' Activities

The Thirty-first Annual Convention of the National Electrical Wholesalers Association will be held at The Homestead, Hot Springs, Virginia, May 24-25, 1939.

Houston Supply Firm to Distribute G-E Products

The General Electric Supply Corporation, which only recently moved into a new building at Polk and Live Oak Streets, Houston, Texas, was recently announced as distributor for all General Electric products in Houston and the surrounding trade territory.

The complete line of General Electric products is now on display in the firm's show rooms.

The company has announced a specialized service which will assist architects, builders and contractors in the building of electric kitchens and homes. Also available immediately will be a store planning service which will advise commercial establishments on refrigeration and electrical equipment installations.

John O. Bell, manager of the Houston organization reports that the firm is looking forward to 1939 as one of the most active years in the sale of General Electric products. B. M. Raborn, formerly district appliance manager for General Electric in Philadelphia, recently joined the company as appliance sales manager.

Miami Distributor Adds New Range Line . .

The wholesale firm of Major Appliances, Inc., of Miami, has just been appointed exclusive distributor for L & H electric ranges and automatic electric water heaters in the Jacksonville and Tampa territories, according to an announcement by W. D. Rowlands, president and general manager. These products are manufactured by A. J. Lindemann & Hoverson Company, Milwaukee, Wis.

Mr. Rowlands' company has been exclusive state distributor for the L & H City and Bottled Gas lines for the past two years.

Supply Company Holds Open House Party . .

Over two hundred electrical contractors, utility representatives, industrial maintenance men and others attended the open house party of the Westinghouse Electric Supply Company, Atlanta branch, during the last week of February. Practically every purchaser of electrical supplies was represented at the meeting which was one of the largest gatherings of its kind ever held in Atlanta.

The purpose of the meeting was to acquaint contractors and others with the newly arranged show room and warehouse facilities of the supply company.

One of the novel features of the evening's entertainment, which was arranged by W. N. Kennon, district sales promotion manager, was a prize contest. $150 in cash and merchandise prizes was awarded to the visitors who were best able to estimate the total number of different items carried in stock.

Among the winners were D. D. Gordon, Georgia Power Company, Cartersville; J. A. Peterson, Cotton States Electric Company, Atlanta; Goodman Harrison, Cleveland Electric Company, Atlanta; and P. H. Hendricks, Hendricks Electric Company, Atlanta. Another feature of the evening was a buffet supper.

Orgill Bros. of Jackson To Handle Hotpoint Line

Effective February 1, 1939, Orgill Brothers and Company, with headquarters at Jackson, Mississippi, was appointed wholesale distributors for Hotpoint refrigerators, ranges, water heaters, home laundry equipment, kitchen sanitation equipment, and Edison commercial cooking equipment throughout the central Mississippi territory.

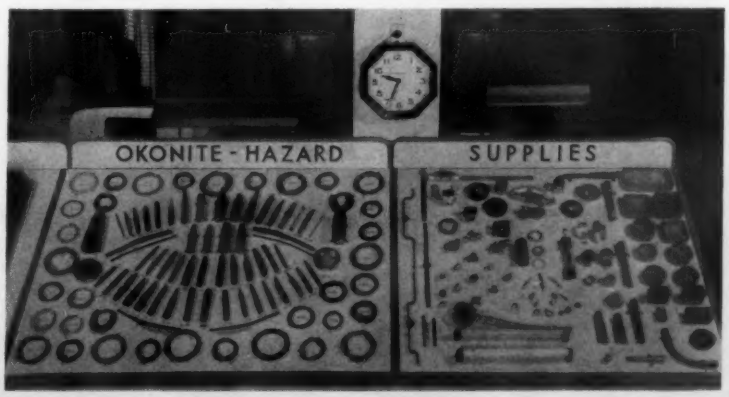
Complete stocks of all Hotpoint major appliances will be carried by the company in their Jackson warehouse, assuring Mississippi dealers of fast service.

Although the Hotpoint line will be new to this distributor in the Jackson territory, the company has had more than two years experience in handling the Hotpoint line through its Memphis, Tennessee, branch.

Leonard Names New Distributors in South

Appointment of three prominent southern firms as distributors of Leonard electric refrigerators has

(*Continued on page* 81)



This display of Okonite-Hazard wire products was one of the points of interest at the Atlanta Westinghouse "open house"

MANUFACTURERS' News

Baltimore Group Holds Successful Show . .

The Electrical Manufacturers Representatives Association of Baltimore, Maryland, held its fifth annual electrical show February 13, 14 and 15 in the new ballroom of the Emerson Hotel.

The show, which enjoyed unusual success, included exhibits of thirty-four members and displays of sixty-five electrical manufacturers, representing practically every nationally known line.

The electrical exhibit was strictly a trade show. Among the various industry groups invited were the Baltimore Engineers Club, the Southern Engineering Society of Hagerstown, Electrical Institute of Washington. Maryland Assembly of Chief Engineers, Delmarva Electrical Association, Purchasing Agents Association of Baltimore, and the Baltimore Engineers Local Union No. 272. In addition, invitations were extended to electrical wholesalers, utility representatives, electrical contractors and inspectors.

No official estimate was made available of the number of visitors but a constant stream of electrical men passed through the exhibit hall throughout the three days of the show.

Philco Co. Announces Refrigerator Line .

Organization of the Philco Refrigerator Company, a subsidiary of the Philadelphia Storage Battery Company, was announced recently with W. Paul Jones of Indianapolis, Indiana, as president of the new company.

Philadelphia Storage Battery Company manufactures Philco radios, which are sold by Philco Radio & Television Corporation. Philco Refrigerator Company acquired the manufacturing rights and patents on the Conservador refrigerator from Fairbanks, Morse and Company, and has assumed control of the latter's refrigerator plant.

The entire plant, which contains 212,000 square feet of floor space, and its facilities have been taken over by the Philco Refrigerator Company. The company is now engaged in an extensive plant rearrangement program, and approximately $50,000.00 will be spent on new machinery and equipment.

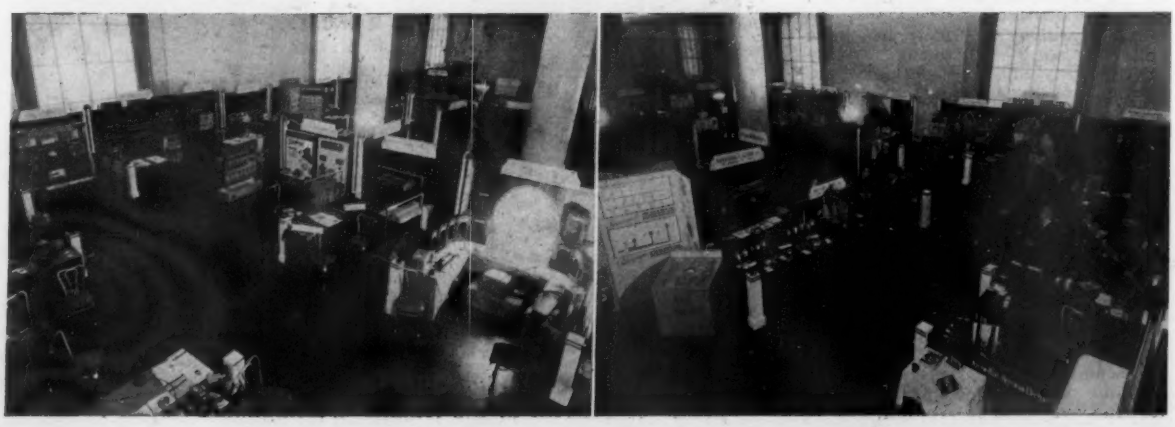
The new line of Conservador refrigerators, manufactured by Philco Refrigerator Company, will be sold and guaranteed by Philco Radio and Television Corporation. The new line was shown to Philco distributors at a national sales convention held in Palm Beach, Florida, February 16th through 19th.

General Electric Launches Spring Road Show . .

Promising to be the most strikingly original presentation of its kind ever assembled to carry a company story to a distributing organization, General Electric's 1939 spring road show, "Get Over Into Clover," complete with motion pictures, professional actors, stage crew, and sets, was given its premiere performance in St. Louis on Wednesday, February 1, before a capacity audience of distributors, dealers, and interested guests. The show will play one-night stands in 50 key cities throughout the country before it concludes in April.

Two complete units, one making eastern and one western points, have been assembled. The eastern troupe, which opened in St. Louis, will conclude its run in Buffalo on April 4, while the western show, opening in Kansas City on February 13, will close in Cleveland on March 29.

New officers of Baltimore Electrical Manufacturers' Representatives Club are, left to right, L. T. McCourt, vice president; E. V. Murphy, president; R. G. Montgomery, secretary; and C. L. Walker, Jr., treasurer. Below is scene in recent show



Uptegraff Plant Moves To Enlarged Quarters

A location has been secured by R. E. Uptegraff Manufacturing Com-

pany at Scottsdale, Pennsylvania, to replace with still greater capacity the plant recently destroyed by fire on Lexington Avenue, Pittsburgh.

The new location will give the Uptegraff Company 40,000 square feet of needed floor space, all admirably situated for shipping and arranged for line production, in the mills formerly occupied by Carnegie-Illinois Steel Company at Scottdale, Pennsylvania. The plant and offices will be remodeled and new power in-

R. E. Uptegraff

stalled, which will give the Uptegraff Company several times greater capacity.

Much of the present machinery will be moved to Scottdale, and also new equipment will be used. The work of rehabilitation will be pushed to provide production at the earliest possible date for the accumulated backlog of orders for Uptegraff transformers, and it is planned to have the plant in operation in March.

The Uptegraff line includes transformers up to 3,000 kva, 66,000 volts. The advertising is prepared by A. D. Walter, Inc., of Pittsburgh.

Death Takes President Of Sangamo Electric Co.

Robert Carr Lanphier, Sr., president of the Sangamo Electric Company, and outstanding civic leader of

Springfield, died at his home recently following a long illness. He had just observed his sixty-first birthday.

Mr. Lanphier was the founder, in 1899, of the Sangamo Electric Company which today has branches in

W. Paul Jones, newly elected president of Philco Refrigerator Co. (See opposite page)

Canada and in England and whose meters are used throughout the world.

Mr. Lanphier was not only a keen business man but was recognized for many years as one of the foremost electrical engineers in the United States.

Although constantly engaged in developing better types of meters, and in supervising the numerous agencies of the company located throughout the world, Mr. Lanphier's greatest interest was in the welfare of his hundreds of Springfield employees, all of whom counted him as their friend. Plans for their security and well being took up much of his time.

News About People

Frank Howell Stohr was recently appointed manager of all industry sales departments of the Westinghouse Electric & Manufacturing Company and **C. F. Lloyd** was appointed manager of the central station sales department of the same company, according to an announcement by Ralph Kelly, vice president.

Mr. Stohr's appointment marks his third advancement since December 1937 when he was named manager of the generator division. He first joined Westinghouse immediately after his graduation as an electrical engineer from the University of Iowa in 1922.

F. H. Stohr

Mr. Lloyd first entered the employ of Westinghouse in 1906 after receiving his degree of bachelor of science from St. John's College at Annapolis.

C. F. Lloyd

His experience has included work in the power correspondence department and high-voltage transmission operations. He has been serving as manager of the electric division in the power department.

* * *

M. C. Turpin, Westinghouse representative for Washington, D. C., and vicinity for the past ten years, was installed recently as president of the active Electric Institute of Washington. Mr. Turpin is well known in Washington's electrical merchandis-

ing circle, as he has been very active in the affairs of electrical interests, both product and organizations. He previously served two terms as president of the Electric League formed in the earlier days before the organization of the present Electric Institute.

* * *

Tom E. Hafer, of Dallas, Texas, has just completed the organization of the Hafer Company which will operate as a manufacturers' agency in Dallas and serve the electrical, automotive and hardware trades of the Southwest.

Grady Millican and **Jack Helliwell** will be associated with Mr. Hafer in the new business. Mr. Millican was for many years automotive buyer for Moore Brothers Electric Company of Dallas. Mr. Helliwell was formerly division sales manager for the Atwater Kent Manufacturing Company and more recently, held the same position with Gibson Refrigerator Corporation.

New Wiring Materials and Devices

Switches and Control Equipment

Multi-Breaker Service Center

The modern multi-breaker service center is one of the important links in adequate wiring progress. Shown here is a flush mounted multi-breaker service center having a double pole range circuit and four single pole lighting circuits. The Multi-breaker complies with the 1937 National

Electrical Code for service entrance equipment and is used instead of the conventional service switch. Circuit ratings are from 15 to 50 ampere capacity in single or double pole. The device illustrated here has grounded neutral and is designed for 115/230 volts 3-wire service. It is manufactured by the Square D Company, Detroit, Mich.

Raintight Enclosed Switches

The Trumbull Electric Manufacturing Company, Plainville, Conn., have announced the addition of raintight type D switches 30-200 ampere, fusible, to their line of enclosed devices. These units are especially applicable for sign lighting installa-

tions and are furnished in aluminum finish both inside and out. They are easy to wire and neat in appearance.

Combination Linestarter

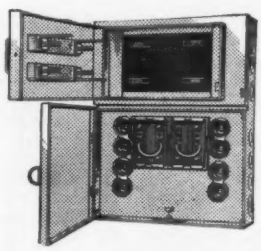
Low installation and operating costs, compactness, and safety are some of the features stressed in a new pamphlet just released by Westinghouse Electric & Manufacturing Company describing the Westinghouse combination linestarters, which combine the De-ion linestarter and the Nofuze De-ion circuit breaker. The arc quencher, dividing and extinguishing the arc almost instantly, eliminates flashover, assuring safety for the operator, and the high overload capacity results in unlimited life of arc box and contacts. The pamphlet, No. B. 2131, may be obtained by writing the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Automatic Time Switches

A new folder just published by the Automatic Electric Manufacturing Company, Mankato, Minnesota, describes their wide range of automatic devices including interval timers for automatically timing any process, or for any purpose. The folder describes not only time switches and flashers for various types of signs but also a number of items having special application such as poultry time switches, time switches for off-peak hot water heaters, and special switches for control of air conditioning, ventilation, and heating equipment.

Improved Service Equipment

Shown here is one of the improved 3800 line of door-operated safety switches offering dead front construction and available in 60 and 100 ampere capacity with and without branch circuit fusing. The 60 ampere type is available with one 60 ampere "Renu-Fuse" pull cover type unit for range installation and with or without branch circuits. The unit is available with 2, 4, 6 or 8 branch circuits for 30 ampere plug fusing. The 100



ampere type is equipped with two 60 ampere "Renu-Fuse" units, one for range and one for water heater installations and is also available with 2, 4, 6 and 8 branch circuits for 30 ampere plug fusing. This new line of safety switches is manufactured by the Wadsworth Electric Manufacturing Co., Inc., Covington, Ky.

Signal Control Switches

These switches, designed to control the operation of audible or visual signals to indicate predetermined time periods, find extensive use among fire departments, industrial plants, and wherever signaling at predetermined times makes for efficiency or safety.

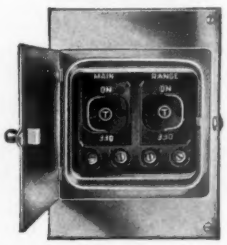
Three types cover all services. One type is for use on regulated a-c frequency where practically no current interruptions occur, while the other two types are hand wound and electrically wound clock mechanisms respectively. The switches are manufactured by R. W. Cramer & Company, Inc., New York, N. Y.

Motor Control Equipment

A complete line of rheostats, motor starters and resistance units are described in a new catalog just published by Schaefer Bros. Company, Chicago, Ill. The catalog shows a variety of motor control apparatus, battery charging equipment, rheostats and resistance units. The manufacturer specializes, however, in control apparatus built to suit special needs and invites inquiries on special items.

Range and Entrance Switch

This new 60 ampere range and entrance switch, designated as No. 2924-4, and manufactured by the Trumbull Electric Manufacturing Company, Plainville, Conn., is compact in design and finished in alumi-



num both inside and out, making the switch easier to wire. The standard switch is provided in surface type with a separate fuse door hinged to front, making possible a semi-flush installation.

Front-Oprated Enclosed Switch

A front-operated type D enclosed switch, called the D Puller, is the newest development of Cutler-Hammer, Inc., Milwaukee, Wis. Rated at 30 amperes, the switches are available for 2 and 3-wire solid neutral service, and 2-pole, 250 volt service. They are available with and without dead-front plates.

Wiring Materials and Supplies

Electrical Trol-E-Duct

An important contribution to the adequate wiring campaign will be found in the 5 foot Handy Set of Universal Trol-E-Duct, for a wide variety of uses in industrial, commercial and domestic fields. Low in cost, it can be quickly installed where needed and provides a ready source

of light and power over individual machines or in special locations.

The Handy Set includes a 5 foot duct section enclosing two bus-bar conductors, supporting hangers, a 5-foot cord with attachment plug and a movable trolley collector or semi-fixed plug for insertion in the duct and into which lights or appliances may be readily wired or plugged. The device is manufactured by the Bull Dog Electric Products Company, Detroit, Mich.

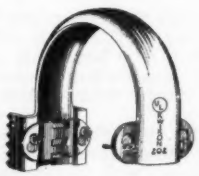
New Weatherproof Sockets

These two new weatherproof sockets are ideal for inexpensive industrial installations. They have standard P & S interiors, cast aluminum shells, and the 2 1/4 inch shadeholders fit either shallow bowl or stan-

dard dome type reflectors. They are available either with 1/2 inch cap or 3/8 inch cap. Manufactured by Pass & Seymour, Inc., Solvay, N. Y.

Service Cable Head

The principal advantage of the new Kwikon service cable head No. 202 is that it prevents the entrance of rain and moisture through the cable to both the meter and testing equip-



ment. This is accomplished by terminating the cable end in a fixed downward position. Fully approved by the Underwriters Laboratories, Inc., this device is manufactured by the Kwikon Company, Chicago, Ill.

New Plug Fuse

This new tamper-resisting fuse, called Tamres, was designed to meet the requirements of local codes specifying tamper-resisting protection for circuits. The fuse has been listed by the Underwriters Laboratories,

Inc. It has an Edison screw shell and the Tamres adapter remains permanently secured in standard screw shell cutout bases. Manufactured by the Chase-Shawmut Company, Newburyport, Mass.

Heat Resisting Cable

Isotherm is the name of a new heat-resisting moistureproof steel armored cable designed for use in control circuits in air-conditioning systems and heating plants and other locations where the cable will be subjected to continuous high temperatures.

The conductors in this cable are rubber insulated but a grade of rubber is used which permits operation at a continuous temperature of 167 degrees Fahrenheit. The cable is manufactured by the American Metal Moulding Company, Irvington, N. J.

Copper Ground Rod

A solid copper star ground rod is the subject of a publication made available by the Anaconda Wire & Cable Company, New York, N. Y. The rod described is made of solid, hard drawn, high-conductivity copper and offers a six-point, star-shaped cross-section that provides greater contact area than a round rod. Other advantages of the product are high tensile strength, solid copper one-piece construction, wide range of available diameters and lengths, and high salvage value.

Bakelite Outlet Box Covers

This new line provides Bakelite switches and duplex receptacles assembled on Bakelite covers for outlet boxes. Switches are available in both single pole and three-way with a sturdy, dependable machanism of the popular residential type. The

Bakelite covers come in two sizes for 3 1/4 inch and 4 inch boxes. Attractively designed for insulated systems or urban work, these devices are manufactured by The Arrow-Hart & Hegeman Electric Company, Hartford, Conn.

Solderless Wire Connectors

These solderless and tapeless wire connectors offer a modern, more convenient and less expensive joint making method. Among the advantages claimed by the manufacturer are that the connectors compress the wires tighter and tighter together as they are threaded into the conical shaped copper coated coil spring insert, and

that thread marks are pressed into the wires, not cut, which hold the wire and connector securely together, giving a perfect copper to copper contact. The connectors are available in a wide range of sizes and types and are manufactured by the Ideal Commutator Dresser Company, Sycamore, Ill.

Cables for Mine Use

Electrical wires and cables designed particularly for use in the mining industry is the subject of a new catalog, No. 179, just issued by the Hazard Insulated Wire Works, Wilkes-Barre, Pa. A considerable part of the book is devoted to mold cured rubber jacketed cables used on coal cutting machines, loaders, electric drills, etc. There is a section on the subject of borehole and shaft power cables, and the catalog also contains instructions for splicing rubber jacketed cables, non-metallic armored cables, and other types of cables. The several useful tables included will make the book particularly useful to mine superintendents and electrical engineers.

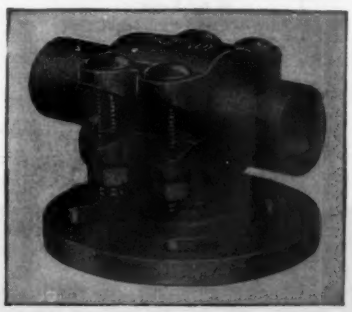
New Weatherproof Sockets

This new line of weatherproof sockets is non-corrosive in all weather. The one piece socket hood is die cast, of a zinc-base metal and is available with 1/2 inch straight or angle cap for 2 1/4 inch shades or 1/2 inch cap without shadeholder. An

attractive sprayed aluminum finish is standard but green finish will be supplied on request without increase in cost. The sockets are manufactured by The Arrow-Hart & Hegeman Electric Company, Hartford, Conn.

Improved Bus Support

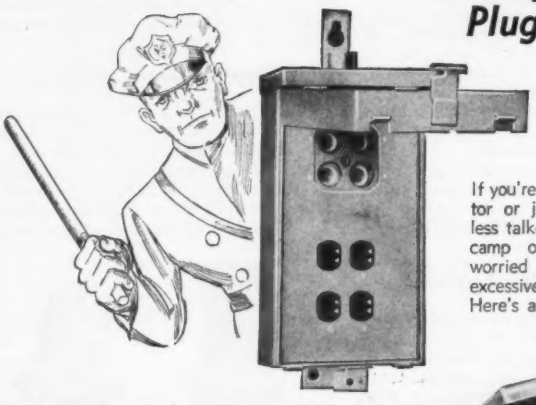
This new bus support, designated as type UH, is constructed with interlocking teeth on the neck of the device which permits the tubular bus to be set at an angle to the steel structure. Finer adjustments than are obtainable through the use of the interlocking teeth may be made by



means of the slightly oval shaped bolt holes in the base. The tube clamping members are so arranged that

RECOMMEND
A Trailer Camp Current
"Policeman" that's FOOLPROOF

Either of these WALKER Tamper - proof Plug-in Boxes



If you're an electrical contractor or jobber, you've doubtless talked to scores of trailer camp owners who've been worried over the problem of excessive use of current. Here's a positive solution!

These inexpensive metal panels are available in two types, for up to ten plug fuses. One type, illustrated above, padlocks both fuse panel and extension cord outlets. Type on right, which is slightly cheaper, locks in fuses only. Both give guaranteed protection for camp owner against excessive use of current and limit user to any amount of current owner specifies. Amount of current is controlled by capacity of fuses, which are constantly under lock and key in both boxes to prevent tampering.

Your WALKER Aids—and how they're made:

- Lighting Panels
- Service Switches
- Cutout and Junction Boxes
- Steel and Aluminum Cabinets of All Kinds
- Extra heavy gauge metal
- Plenty of wiring space
- Durable finish
- Streamlined design

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Walker Manufactures Items to ANY Specification—Simply Tell Us Your Problem. Send for Your Catalog Today!

WALKER
ELECTRICAL COMPANY
ATLANTA, GEORGIA

either a tight fit or a slide fit may be obtained, according to requirements. The support is manufactured by Burndy Engineering Company, Inc., New York, N. Y.

New Range Cord Set

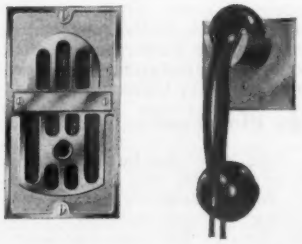
Equipped with Bakelite cap and rubber cable, this new range cord set is available in a variety of lengths with cables either of two No. 8 and one No. 10 conductors or two No. 6 and one No. 8 conductors. Positive connection is assured through the heavy brass prongs that are electrically welded to the conductors. The

cord is gripped tightly by the neck of the cap relieving strain on the prong and cable connections. Each cord set is equipped with a clamp for attaching the cord to a range connection box. The sets are manufactured by the Bryant Electric Company, Bridgeport, Conn.

Couch Safe-T-Fone

The Safe-T-Fone, made by S. H. Couch Company, Inc., North Quincy, Mass., is a new household protective device to enable the housewife to interview front door callers by telephone.

The No. 678 Safe-T-Fone kit consists of flush mounted speaker type door phone with heavy cast bronze



face plates and a house phone with bakelite handset which is supported by bakelite cup mounted on brass plate fixed to wall. Equipment includes concealed buzzer which is operated from the button on the door phone.

Colonial Door Chime

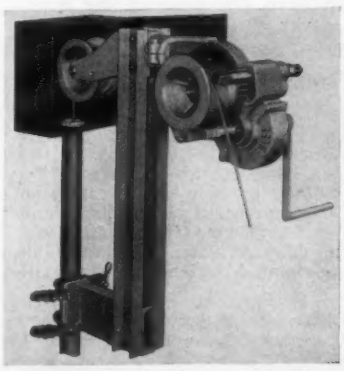
The Colonial is a new model in an electric door chime styled to blend with the colonial theme used in interior decoration. The Colonial chime has a light ivory suede shield with a decorative insert of blue. Em-

bossed on the blue insert is the American Eagle in brass relief. This item is made by Edwards and Company, Inc., Norwalk, Conn.

Meters, Instruments and Tools

Greenlee Cable Puller

Greenlee Tool Co., Rockford, Ill., has announced a new cable puller, No. 765. This is a geared windlass device, turned by cranks which are furnished or by ratchet wrench, which features easy operation, portability and positive anchorage for awkward pulling jobs. It weighs 170 pounds, and can be clamped onto conduit (from 2- to 5-inch) through which the cable is being pulled.



The machine will exert a maximum pull of 7,500 pounds, and it has two speeds, through a direct gear and through a back gear. A shear pin is provided in the back-gear shaft to prevent damage under excessive pull, and a dog on the back gear prevents unwinding of the cable in the event of pin shearing. The device is adjustable to various positions to allow operating clearance.

Reach out
for NEW business
with Wiremold
WIREMOLD
FLUORESCENT STRIP
Right now is the time to take full advantage of the many business building opportunities opened up by this new and revolutionary type of lighting for display, commercial and industrial installations. Wiremold Fluorescent Strip is economical, easy to install and includes scientifically correct specular finish Alzak aluminum reflectors which can be used in either symmetric or asymmetric position.
Here's the up-to-the-minute information you need on how to sell and install Fluorescent Lighting
Wiremold data sheets and engineering service are yours for the asking. Send us the information on Fluorescent jobs in your territory and let us help you turn them into profitable contracts.
ADEQUATE WIRING SERVES AND SAVES
WIREMOLD
Your BUSINESS BUILDER
THE WIREMOLD COMPANY HARTFORD, CONN

New Portable Test Meter

A new portable test meter, Type J-33, made by Sangamo Electric Company, Springfield, Ill., is especially adapted to the testing of watt-hour meters of the capacities usually employed in residential service. Sep-

arate current terminals are used for each of three current ranges—1, 5, and 15 amperes.

Features of this meter are: Minimum size, light weight, silver contact potential switch, spring-supported lower jewel bearing, straight-line accuracy and current-carrying capacity for twice the rated load. Bulletin No. 92, which contains the full description of this meter, will be sent upon request to the manufacturer.

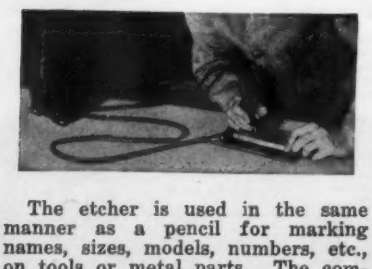
Heavy Duty Bench Grinder

A new deluxe model in the Diehl Heavy Duty Bench Grinder has been recently announced by Diehl Manufacturing Company, Elizabethport, N. J. This unit is equipped with adjustable safety eyeshields of shatter-proof glass. It also has a Diehl-Lite mounted on top of motor to provide convenient local lighting on either grinding wheel. These new features extend considerably the usefulness of the heavy duty grinder.

A bulletin, No. 1932, which describes the new deluxe heavy duty model and other bench grinders and attachments in the Diehl line will be sent upon request.

Etcher for Hardened Steels

A new low-priced electric etcher, made by Ideal Commutator Dresser Co., Sycamore, Ill., marks iron and steel and their alloys, including hardened steels, legibly and permanently.



The etcher is used in the same manner as a pencil for marking names, sizes, models, numbers, etc., on tools or metal parts. The complete unit includes a handpiece and alloy point, transformer with three taps, special primary cord with tap-changing switch, secondary leads of No. 8 wire, and a work plate. It weighs 12 pounds. Three etching speeds are controlled by switch on the primary cord.

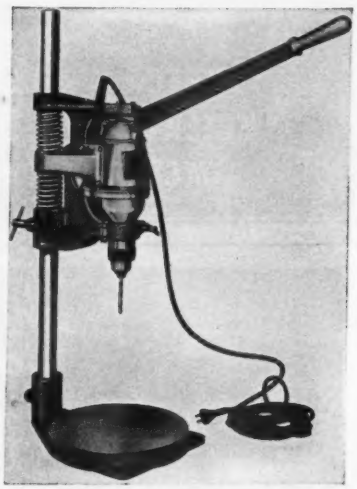
Folder on Fuse Pullers

Trico Fuse Mfg. Co., Milwaukee, Wis., has recently issued a new folder describing their laminated Trico fuse pullers, made of horn fibre. This material is tested at 35,000 volts. Laminated construction gives greater strength.

These pullers are made in midget size, pocket size, giant size, and jumbo size, and in a deluxe model of polished black bakelite. This descriptive folder will be sent by the manufacturer upon request.

Convertible Drill Press

Signal Electric Mfg. Co., Menominee, Mich., has announced a new bench stand which with the Signal OB-5½-inch drill can be converted easily into a convenient stationary



drill press. The new bench stand, No. DS-5, is substantially made, stands 32⅜ inches high above the base, which is 11 inches in diameter. The vertical column is 1½ inches in diameter.

Jewelled Hand Tachometer

A new Universal Hand Tachometer has been designed by the George Scheer Co., 128 Lafayette Street, New York, N. Y., for measuring speeds over a wide range.

This new model, the S & S Jewelled Hand Tachometer, containing eight jewels, is available in two models, one measuring from 30 to 40,000 rpm and the other from 25 to 30,000 rpm. The pointer makes two turns around the dial, giving readings on two sets of numerals. In this way the instrument gives twice as much speed coverage within one range.

Inkless Recording Instruments

Continuous accurate operation for 30 days without attention at temperatures as low as —10 degrees Farenheit and as high as 120 degrees Farenheit is claimed for General Electric Company's Type CF-1 line of inkless recording ammeters and voltmeters. These instruments use a typewriter ribbon, recording by a series of dots.

Mounted in cast aluminum alloy cases, these meters may be used indoors or outdoors, are portable, and may be wall or pole mounted. Voltmeters are listed for double range of 0-140/0-280 volts. Ammeters are for 0-5/0-10 amperes. Single range instruments can be supplied.

Lighting Fixtures and Accessories

Bryant Fluorescent Lampholder

Bryant Electric Company, Bridgeport, Conn., have announced a new "straight push" lampholder, No. 4302, for fluorescent lamps.

Available in black or white bakelite. One screw-mounting provides easy and rapid assembly, mounting dimensions are standard. Outstanding feature is that lamp may be inserted by a straight push and removed by a side push on the lamp. For either surface or flush mountings.

Benjamin Flur-o-Line Unit

Flur-O-Line units for fluorescent lamps, made by Benjamin Electric Manufacturing Company, Des Plaines, Illinois, are designed for end-to-end or side-by-side installation of fluorescent lamps. Each unit is a self-contained fixture in itself, having deep reflector and detachable wiring-channel which houses auxili-

aries and conceals the wiring. Various accessory fittings provide a variety of practical arrangements.

Flur-O-Line units have reflectors of polished alzak aluminum, cast aluminum, cast aluminum end plates. This fixture is primarily for industrial use.

"Lamps, By Lightolier"

A new and extensively illustrated catalog, called "Lamps, by Lightolier" has just been issued by the Lightolier Company of Jersey City, N. J., specialists in light conditioning for more than thirty years. The new catalog features ten groups of floor and table lamps covering every residence requirement. The catalog also includes designs ranging from Early American and 18th Century, English and French, through Williamsburg Colonial to the present vogue for Swedish Modern. Light requirements of units either conform to or surpass the I. E. S. standards.

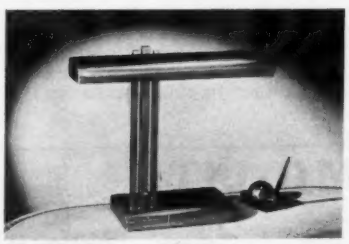
Daylight Fluorescent Fixture

This new fixture especially designed for fluroscent lamps is available in two sizes to accommodate either the 18 inch or the 36 inch fluorescent lamps. The units are particularly suitable for such operations as in-

spection, drafting, color matching, etc. The fixture is finished in three coats of permanent porcelain enamel, white inside. They are manufactured by the Goodrich Electric Company, Chicago, Ill.

Desk Type Fluorescent Unit

The new fluorescent Mazda daylight lamp is now utilized in a modern desk unit offered by Illuminating Arts, of North Chicago, Illinois.

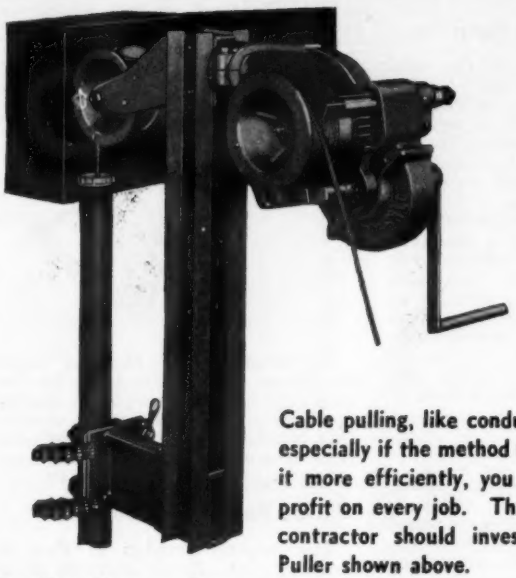


The No. 800 "Fluoresight" shown here has a handsome dark oxidized copper finish, is 15 1/2 inches high overall with a shade length of 18 1/4 inches. The list price of the desk lamp is $18.75.

Fluorescent Wall Bracket

Gruber Brothers, 72 Spring Street, New York, N. Y., have announced a new decorative wall bracket designed for the 18-inch fluorescent lamp. This bracket, No. 30-18, comes wired and with auxiliaries and sockets

Efficient Cable Pulling
ADDS TO PROFITS ON EVERY JOB



GREENLEE
Cable Puller
PORTABLE
POWERFUL
CONVENIENT

Cable pulling, like conduit bending, is expensive,—especially if the method used is obsolete. If you do it more efficiently, you cut costs and add to the profit on every job. That is why every progressive contractor should investigate the new Greenlee Puller shown above.

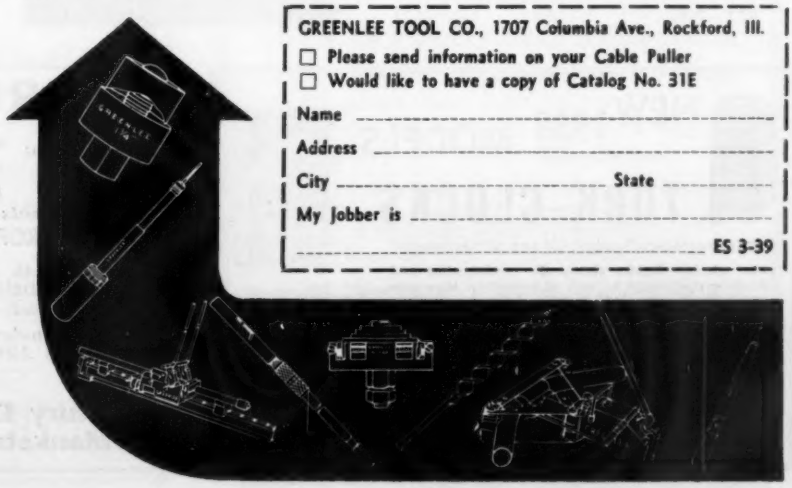
Here is a tool that is in a class with Greenlee Hydraulic Conduit Benders as a time and labor-saving device. It is easily clamped right to the conduit through which cable is to be pulled, preventing the loosening of hangers. The drum can also be used as an ordinary winch, since it is detachable and has a base provided on it for bolting to a plank. It weighs only 170 pounds, has two speeds, and will exert a pull of 7500 pounds.

Do You Have a Copy of Catalog 31E?

If you have a copy of the Greenlee Tool Catalog, No. 31E, turn to page 32 for a description of this new cable puller. If you haven't a copy, ask for one now. This catalog also includes Hydraulic Conduit Benders, Knockout Punches and Cutters, Joist Borers, Spiral Screw Drivers, Automatic Push Drills, Electricians' Bits, Bit Extensions, Hydraulic Pipe Pushers, and Copper Tube Benders.

GREENLEE TOOL CO.
1707 Columbia Ave.
ROCKFORD, ILLINOIS

GREENLEE TOOL CO., 1707 Columbia Ave., Rockford, Ill.
☐ Please send information on your Cable Puller
☐ Would like to have a copy of Catalog No. 31E
Name _____
Address _____
City _____ State _____
My Jobber is _____
ES 3-39



which are housed inside of the metal channel. Made of heavy gauge metal, available in satin chrome finish. Center screw and box strap are furnished for fastening direct to outlet box.

Gruber Brothers manufacture a variety of other fluorescent fixtures, which are described in a new folio No. 39C. A copy of this new folio will be sent upon request to the manufacturer.

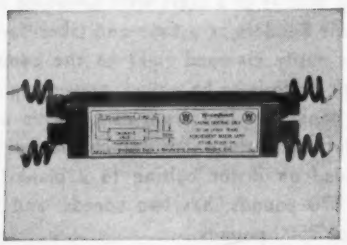
Pickwick Fluorescent Strip

The Pickwick Metalcraft Co., 489 Broome Street, New York, N. Y., now manufactures a line of fluorescent lighting strips—with or without reflector, which is adjustable to any position—and a series of special fixtures for commercial and industrial use of fluorescent lamps.

The lighting strip is available in an economy model and a standard model. Raceways are of sprayed aluminum, and may be had with chrome covers and with chrome or alzak reflectors. A cast mounting unit makes the standard model somewhat higher in price. Descriptive literature including specifications and prices may be obtained by writing to the manufacturer.

Lamp Control Units

A new control unit for fluorescent lamps, to maintain current and voltage at proper values, is announced by the lighting division of Westinghouse Electric and Manufacturing Company, Cleveland, Ohio.



The new Westinghouse unit is sturdy and compact, built in a compound-filled case including thermal switch, a reactor, and a small capacitor to eliminate radio interference. This unit can be mounted in almost any standard wireway. Standard mounting lugs also permit mounting in any other location where conservation of space is important. For outside use the control units must be protected from the weather.

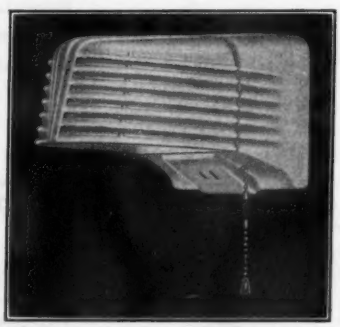
Canopy Bracket for Spotlight

The F. W. Wakefield Brass Co., Vermilion, Ohio, have developed a new canopy bracket which permits mounting of spotlights for special lighting purposes on the canopy of existing ceiling fixtures.

The bracket arm is fastened under the fixture canopy. The leads for the lamp may be run through the canopy knockout to tap the fixture circuit. This bracket, No. 41-R, is designed to be used with Wakefield's projector lamps No. Par-38 and No. R-40.

Alabax Porcelain Bracket

The Alabax Division of Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y., have announced a new wall bracket, No. AL-2390, of distinctive modernistic design. This includes the bracket, with pull chain switch or keyless, and opal glass shade which accommodates 60 watt lamp. The bracket may be had in white, black or ivory glaze, or light green; the glass is always white opal. The bracket is available with or without convenience outlet.



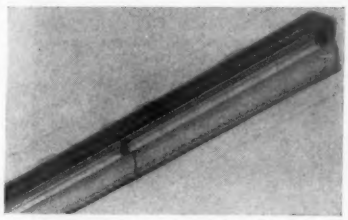
RLM Standards Explained

In a new book, "Meaning of the RLM Label," the RLM Standards Institute discusses the full significance of the RLM label, explains the RLM standards, prescribes the essentials of correct lighting and treats many other factors of modern light conditioning.

A copy of this book may be obtained without cost by writing to the RLM Standards Institute, 20 North Wacker Drive, Chicago, Illinois.

Reflector for Fluorescents

The Wiremold Company, Hartford, Conn., has designed a concentrating type reflector for use with the fluorescent lamp and Wiremold fluorescent strip. Available for use with either the 18, 24 or 36-inch



lamp, this reflector is of alzak aluminum finish. Coefficient of reflection, 83 to 85 per cent.

The reflector may be mounted in a normal position or tilted to 22 1/2 or 45 degrees from the normal.

Industrial Lighting Unit

Equipment for the construction of fluorescent lighting units especially suitable for industrial inspection lighting, continuous lighting over work benches, and similar applications, is now available from Wilson Lighting, Inc., Chicago, Ill.

The unit shown here is constructed entirely with standard Wilson fluorescent channel and reflectors and is available either in single units or in

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ALL ELECTRIC
TORK CLOCKS
"Turn anything electrical ON and OFF regularly"
For window lights, signs, air conditioning and heating equipment as well as industrial time control. Flush mounted models—Astronomic dials.
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Hotel Tampa Terrace . *Tampa*	3.00 *up*	
Hotel Floridan . . . *Tampa*	3.00 *up*	
Useppa Inn . . . . *Useppa Island*		11.00 *up*
Gasparilla Inn . . . . *Boca Grande*		11.00 *up*
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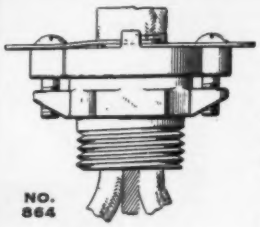
NO. 864
ADJUSTABLE WATERTIGHT CONNECTOR
for Entrance Service Cable



NO. 864

This type connector will take the 3-4; 3-6; 3-8 oval, or 1-6; 2-6 round cable. These connectors are 100% watertight, as we use a plastic compound for a seal rather than rubber.

NO. 22
BARE WIRE GROUND CLAMP

NO. 22

This bare wire clamp, is "Simplicity Plus". It is convenient to install and priced right.

Send for Bulletin No. S-11, which shows our complete line of fittings.

We are illustrating in this bulletin a new device, which will be of special interest to the meter engineers. Send for your copy.

The M & W ELECTRIC MFG. CO., INC.
EAST PALESTINE, OHIO

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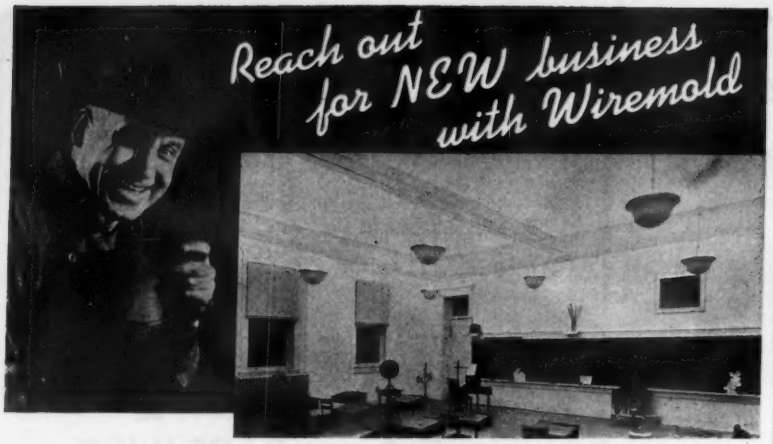

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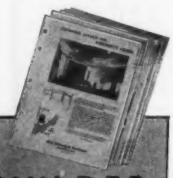
Wiremold data sheets are available showing typical school lighting improvement jobs. They're yours for the asking . . . also Wiremold Engineering service on your own particular jobs. Write us today.



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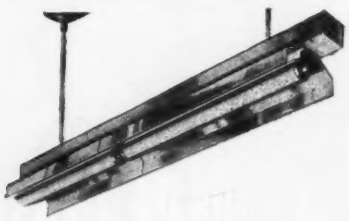


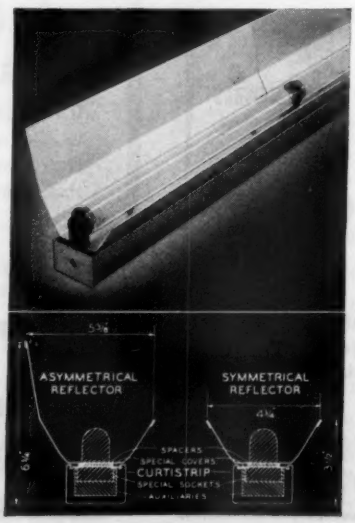
cont nuous installations of any desired length. Reflectors are available in either Alzak processed aluminum or standard polished aluminum in a wide variety of shapes.

Show Window Reflector

The new Sterling No. 704 reflector, developed especially for more efficient illumination of low, medium or deep show windows where merchandise is trimmed high, combines the construct on characteristics of the Sterling Lite-Flo Stipple and Sterling Silver Glass reflectors. The opening is perfectly round and is 7 inches in diameter, facilitating flush mounting. The units are furnished complete with holder and use a standard 100-watt A-23 lamp. The reflectors are manufactured by Sterling Reflector Co., Chicago, Ill.

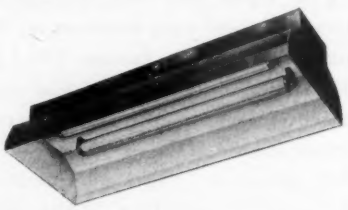
Fluorescent Lamp Accessories

To meet the extensive need for fluorescent lamp installations, Curtis Lighting, Inc., of Chicago, Illinois, has developed a flexible line of fluorescent lighting equipment which is now available. The standard wiring channel, CurtiStrip, serves as a basis for fluorescent lamp assemblies. Into it will fit neatly and compactly the necessary auxiliaries and wiring. One of the advantages of CurtiStrip is that it may be installed on the job in any length which makes it particularly flexible in use. In addition to the wiring channel, Curtis offers a number of special Curtis fittings which may be utilized for single lamp or cont nuous strip assemblies, for exposed or concealed fixtures, for direct or indirect lighting schemes, and for industrial, commercial, or decorative installations.



Fluorescent Lamp Fixtures

A wide range of lighting fixtures for use with fluorescent lamps are described in a new catalog just issued by the Wheeler Reflector Company, Boston, Mass. The catalog describes units of the individual reflector type



in both Alzak aluminum and porcelain enamel particularly adapted for inspection use; open hood type units and open end type units. Angle type reflectors are also described and a special unit suitable for direct mounting on drafting tables is shown.

Indirect Lighting Luminaire

To meet the need for a low priced but eff cient totally indirect lighting unit, the Pittsburg Reflector Company, Pittsburgh, Penna., has introduced its Permaflector Luminaire No. B-53. The canopy, stem and bowl of this sturdily built unit are made of steel but aluminum is used for the husk. The new fixture contains an efficient silver glass reflector which controls and distributes the light, the bowl serving only as an ornamental enclosure.

Daylight Counter Units

Fluorescent lamps are utilized in the new daylight counter units especially designed by the Miller Company, Mer.den, Conn., for use in retail stores selling merchandise of a type which requires color discrimination. These units are available in two styles: the Simple style is finished in polished chrome combined

with crackled black; the DeLuxe style is finished in Nuvon and polished chrome. A 7-foot cord with plug permits either style to be conveniently placed on counter or table. A toggle switch in the back of the unit enables clerks to operate it easily from behind the counter.

Leonard Names New Distributors in South

(*Continued from page* 69)

been announced by E. R. Legg, Leonard's general sales manager.

The new distributors are:

The Otasco Supply Company, Tulsa, Okla., which will distribute the company's refrigerators throughout Oklahoma and in a small portion of Arkansas. Officers of the company are M. Sanditen, president; S. M. Sanditen, vice president, and E. G. Sanditen, sales manager. The company operates 39 stores in Oklahoma and has 27 associate stores throughout this state and Kansas.

The Magic City Appliance Company, Birmingham, Ala., territory of which is the northern portion of Alabama. E. H. Abernathy is manager of this company, which operates both as a wholesale and a retail organization.

Page-Williamson, Inc., Charlotte, N. C., serving the western part of North Carolina and all of South Carolina. President of the company is W. H. Williamson, Jr.

What Do You Know About Motors?

(*Continued from page* 68)

These are correct answers for the "True or False" statements listed on page 68.

(1) *False.* A "basket winding" derives its name from the manner in which the coil ends interlace one another, as shown in Fig. 1.

(2) *True.* There is only one coil side per slot, thus one coil fills two slots. See Fig. 1.

(3) *True.* The glass insulation can be obtained in thinner walls, which together with its toughness results in less winding troubles.

(4) *False.* It is higher, and all coil ends of basket windings are insulated as phase coils.

(5) *True.* The top half of the coil extends straight out and the bottom half is bent down. Thus there must always be an even number of slots between both coil sides. See Fig. 1.

(6) *False.* There is only one-half as many coils in series per a pole phase group when the number of slots, phases, and poles are the same.

(7) *True.* The coils are wound flat, or hit and miss, but the moulds

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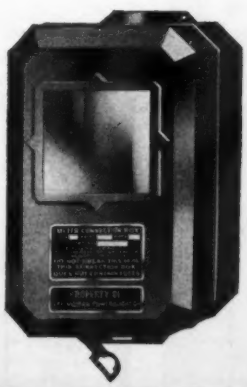

Illustrated is the C-B 14 aluminum meter enclosure for outdoor and indoor new sequence metering.

Your library should contain copies of Corcoran-Brown Catalogues, 57, 58A, 61, 62, 63. Write for them today.

Electrical Department
CORCORAN-BROWN LAMP DIVISION
THE ELECTRIC AUTO-LITE COMPANY
4900 Spring Grove Avenue Cincinnati, Ohio

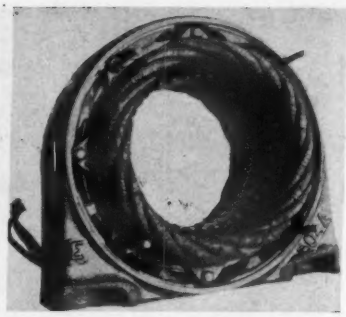

Fig. 1—Typical basket winding composed of flat mush wound coils

have a special shape, as shown in Fig. 2.

(8) *False.* The longest straight part or slot section is the bottom or the first of the coil wound into the stator. It is longer because the ends must be bent down. See Figs. 1 and 2.

(9) *True.* On the mould, the slot section is the shortest but in the throw or pitch direction, the top side is the longest. See Fig. 2.

(10) *True.* For proper connecting location, the leads should be brought out on the bottom near the point, as shown in Fig. 2.

(11) *False.* The tape on the coil ends should be passed around the winding cell, up to the core, sealing and protecting the coil ends.

(12) *False.* The coils are too large, require too much shaping, and are hard to handle.

(13) *True.* The number of coils per a pole phase group is only one half. Therefore, there are only half the number of stub connections.

(14) *True.* In contrast to diamond two-layer coil windings, the leads are crossed over the lower coil ends.

(15) *False.* The number of "pole phase groups" in both types of windings is equal to "number of poles times number of phases."

(16) *True.* By winding twice as many coils, each coil with half the number of turns, it can be converted to a gang mould winding that requires less shaping and no stub connections.

(17) *True.* Odd groupings are common with basket windings.

(18) *True.* The total number of coils per motor or winding, also per a pole phase group is doubled. Consider Fig. 1 which has 36 slots, 4 poles, 2 phase, and 18 coils, or 1-1/2 coils per group, an odd grouping. On the other hand, 36 coils in a two-layer winding result in 3 coils per group, or an even grouping.

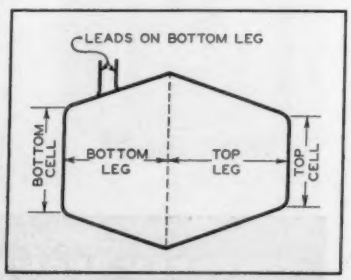

Fig. 2—Shape of mold and flat mush coil for basket winding

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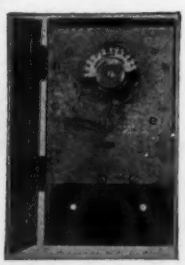

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